

MASS. Y3.MP1:M32/3

UMASS/AMHERST



312066016678597

# MAPC REGIONAL BICYCLE & PEDESTRIAN PLAN



GOVERNMENT DOCUMENTS  
COLLECTION

OCT 17 1997

University of Massachusetts  
Depository Copy



Metropolitan Area  
Planning Council  
60 Temple Place  
Boston, MA 02108



Digitized by the Internet Archive  
in 2015

<https://archive.org/details/mapcregionalbicy00mass>

## **ABOUT THIS REPORT**

The Metropolitan Area Planning Council (MAPC) is the officially designated regional planning agency for 101 cities and towns of metropolitan Boston. The Council helps its member communities plan in the areas of economic development, land use, housing, demographics, transportation, and environmental quality.

MAPC wishes to thank the members of the MAPC Bicycle/Pedestrian Committee for their assistance throughout the preparation of this report.

The preparation of this document was supported by the Massachusetts Highway Department and Federal Highway Administration and by state and local matching funds.

### **Credits:**

Project Manager: Joan Blaustein  
Graphics: Mara Geoghegan

**MAPC Officers:** 1996-1997  
President: William G. Constable  
Vice-president: Richard A. Easler  
Secretary: Grace S. Shepard  
Treasurer: Richard C. Walker, III

**Executive Director:** David C. Soule

Metropolitan Area Planning Council  
60 Temple Place  
Boston, MA 02111  
(617) 451-2770

February 26, 1997



# MAPC REGIONAL BICYCLE AND PEDESTRIAN PLAN

## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>iii</b>
 <b>I. THE FUTURE OF BICYCLE AND PEDESTRIAN TRANSPORTATION IN THE BOSTON METROPOLITAN REGION</b>	
A Vision for Bicycle and Pedestrian Transportation in the Region .....	1
The Benefits of Bicycle and Pedestrian Travel .....	1
The National Context for Bicycling and Walking .....	2
 <b>II. THE POLICY FRAMEWORK</b>	
The Transportation Element of MetroPlan 2000 .....	3
Bicycle Policies and Action Recommendations .....	3
Pedestrian Policies and Action Recommendations .....	5
 <b>III. THE REGIONAL BICYCLE SYSTEM</b>	
The Components of a Regional Bicycle System .....	7
Key Concepts Related to Meeting the Future Needs of the System .....	7
Institutionalizing Bicycle Planning .....	7
Liability .....	8
Determining the Appropriate Type of Facility .....	8
Types of Trips .....	10
Inventories and Surveys .....	11
Designated Bicycle Facilities .....	12
Shared Roadways .....	21
Bicycle Parking .....	23
Initiatives that Encourage Bicycling .....	24
Inter-modal Access .....	26
Land Use Considerations .....	28
 <b>IV. THE REGIONAL PEDESTRIAN SYSTEM</b>	
The Components of a Regional Pedestrian System .....	29
Municipal Regulation of the Pedestrian Environment .....	30
Sidewalks .....	32
Intersections .....	33
Mid-Block Crossings .....	33
Trails and Pathways .....	34
Traffic Signals .....	35
Maintenance .....	35
Traffic Calming .....	35
Walking in an Inter-Modal Context .....	36
Land Use Considerations .....	36

## **V. IMPLEMENTATION OF THE REGIONAL BICYCLE AND PEDESTRIAN SYSTEM**

Introduction .....	39
Identifying Regional Bicycle and Pedestrian Priorities .....	39
Regional Bicycle/Pedestrian Project Priorities .....	40
Updating the Project List .....	41
Implementing Project Priorities .....	41
The Transportation Improvement Program (TIP) .....	54
Pavement Management .....	54
Reviews Under the Massachusetts Environmental Policy Act (MEPA) .....	55
Technical Assistance to Communities and the Subregions .....	55
The Municipal Role .....	55

## **TABLES AND MAPS**

III-A Existing and Potential Regional Facilities .....	19
V-A Summary of Bicycle/Pedestrian Projects .....	40
V-B Regional Bicycle and Pedestrian Projects .....	42
V-C Bicycle and Pedestrian Projects - Additional Data .....	54

## **APPENDICES**

A. Municipal Bicycle Parking Zoning Bylaws .....	57
B. Reference Materials on Bicycle and Pedestrian Planning .....	61

# **THE REGIONAL BICYCLE AND PEDESTRIAN PLAN: EXECUTIVE SUMMARY**

## **Purpose of the Plan**

The Regional Bicycle and Pedestrian Plan is designed to provide a regional context for all bicycle and pedestrian planning efforts in the 101 cities and towns of the MAPC region. The plan sets forth and elaborates on the bicycle and pedestrian goals and policies of the Metropolitan Area Planning Council and provides basic technical information to communities as they undertake bicycle and pedestrian planning projects.

## **Goals and Objectives:**

- ⇒ Increase the use of bicycles as a means of transportation by removing barriers to bicycling, providing a range of facilities geared to different types of riders and by creating incentives for the increased use of bicycling.
- ⇒ Work to create separate facilities for bicycles and pedestrians wherever feasible. Where this is not feasible, take steps to prevent conflicts.
- ⇒ To have bicycling recognized as a legitimate mode of transportation and be fully integrated into the transportation planning process.
- ⇒ To have bicycle access integrated into the design and review of sites, buildings and transportation facilities and laws at the state, regional and local level.
- ⇒ To increase bicycle use by providing a range of facilities and improvements to accommodate cyclists of varying abilities.
- ⇒ To have municipalities, the state transportation agencies, regional agencies and private entities share the responsibility for creating a more bicycle-friendly environment.
- ⇒ To plan and provide for walking as a legitimate mode of transportation fully integrated into the transportation planning process. Increase walking as a mode of transportation by providing a range of facilities, and by creating incentives for people to walk.
- ⇒ Create separate facilities for bicycles and pedestrians wherever feasible. Where this is not feasible, take steps to prevent conflicts.
- ⇒ To have pedestrian access and safe, legal walking be integrated into the design and review of sites, buildings, transportation facilities and laws.
- ⇒ To increase walking by providing a range of facilities and improvements geared to accommodate walkers of varying abilities, ages, and disabilities.
- ⇒ To have municipalities, state transportation agencies, regional agencies and private entities share the responsibility for creating better pedestrian circulation.

## **The Regional Bicycle System**

A comprehensive regional bicycle system consists of physical as well as non-physical elements. In bicycle and pedestrian transportation planning, it is common to talk about the four **E**'s of a bicycle/pedestrian transportation system:

**E**ducation  
**E**nforcement  
**E**ngineering  
**E**ncouragement

**Shared Roadways** - The largest component of the regional bicycle system consists of shared roadways (any roadway which may be legally used by bicycles). It is anticipated that shared roadways will continue to constitute the largest part of a regional bicycle transportation system. Cyclists desire access to the same destinations as motorists and the existing road network provides far more coverage of the region than a network of bicycle paths can.

Because bicycles will be ridden on all roads where they are allowed, all new roads and roadway improvement projects need to be designed and constructed following bicycle-safe design practices.

**Parking** - Bicycle parking is also an important component of the system. All MAPC communities should include bicycle parking requirements in their zoning bylaws.

## **The Regional Pedestrian System**

Pedestrian planning needs greater attention because almost everyone walks at some point in the day. The quality of the pedestrian environment is heavily influenced by policies, procedures and regulations at the local level.

**Municipal Regulations** - A review of municipal bylaws revealed that the degree of pedestrian accommodations varies widely with some communities having fairly complete coverage of key topics and others with only one or two provisions in their bylaws. MAPC can do a complete search of pedestrian-related zoning provisions for any community upon request.

**Sidewalks** - Sidewalks are the most important physical accommodation for the pedestrian. When planning for sidewalks, the following factors should be kept in mind:

- Location
- Width
- Grade
- Separation from roadways
- Uses allowed on sidewalks
- Maintenance
- Placement of obstructions

### **Multi-Use Paths**

MAPC has adopted the policy that bicyclists and pedestrians should be separated whenever possible and particularly where safety concerns dictate this approach. However, there is a great demand for multi-use paths in the region. Wherever such facilities have been built, they are heavily used by bicyclists, walkers, in-line skaters and joggers.

## **Regional Priorities**

MAPC undertook a process to identify projects that meet regional needs. The primary criteria that were used to identify a regionally significant project were the project's relationship to a designated Concentrated Development Center and its contribution to improving access to transit. Secondary criteria were whether or not a project was part of a network of existing or proposed facilities, whether it served more than one community and whether the project removed an obstacle or significantly improved safety. Based on these criteria, MAPC identified high and medium priority regional projects and local projects.

<b>Project Type</b>	<b>High Priority Regional</b>	<b>Medium Priority Regional</b>	<b>Local</b>
Paths	15	18	12
On-road	28	30	21
Parking	55	44	86

### **Implementing Project Priorities**

A key function of the project priority list will be to help guide MAPC's efforts to implement the plan. Because projects are at different levels of development ranging from conceptual to under construction, implementation activities will vary. MAPC's efforts will be directed primarily towards those projects identified as high priority regional projects. For projects that are in the planning stage, MAPC will assist project sponsors in identifying and applying for appropriate funding sources. Priority status will be one factor that MAPC will consider, as one of the MPO agencies responsible for funding decisions on the Transportation Improvement Program.

For high priority regional projects that are conceptual, MAPC will work with communities and state agencies to further evaluate and develop these concepts to bring them to the planning stage. These projects are critical to MAPC because they help to implement MetroPlan 2000.

Because many worthwhile projects, particularly pedestrian improvements, are local rather than regional MAPC will also assist local bicycle and pedestrian committees to develop projects and plans.



# **I. THE FUTURE OF BICYCLE AND PEDESTRIAN TRANSPORTATION IN THE BOSTON METROPOLITAN REGION**

## **A Vision for Bicycle and Pedestrian Transportation in the Region**

Bicycles are a visible and growing form of transportation in the Boston metropolitan region. Commuters make use of the Minuteman Commuter Bike Way on weekdays, and on weekends recreational riders use this trail. On Sundays in the summer, Memorial Drive is closed to traffic and is open to cyclists, pedestrians, joggers and in-line skaters. In many of the western suburbs such as Lexington and Concord, bike clubs meet and hundreds of cyclists enjoy rides on the back roads. Bicycle messengers use the city streets and children cycle to school and to visit with friends. Even during the winter, cyclists continue to use local roads.

Pedestrians are even more prevalent, particularly within urban areas. Children who are too young to drive and residents without access to a car rely on walking to a greater degree than most residents. Many people combine walking and public transportation for their daily commute or for doing errands.

MetroPlan 2000 supports the increased use of bicycle and pedestrian transportation. Concentrated development is one of the central principles of MetroPlan 2000. By encouraging concentrated development, trip distances are shortened and are better able to be served by walking and bicycling. Bicycling and walking decrease road congestion, help to reduce auto emissions, and help the region to meet air quality standards. They provide an affordable form of transportation for residents without access to a car. They are also healthy forms of recreation.

The Regional Bicycle/Pedestrian Plan is designed to provide a regional context for all bicycle and pedestrian planning efforts in the 101 cities and towns of the MAPC region. As a regional planning agency, MAPC is uniquely suited to presenting the "big picture" in the form of a regional bicycle/pedestrian plan and to providing technical assistance to communities as they play a key role in identifying and developing projects and in creating a more bicycle and pedestrian friendly environment at the local level. MAPC can also play an important role in helping to coordinate the activities of the many local, state and community governments, agencies and groups who are involved in bicycle and pedestrian planning. In conjunction with the transportation element of MetroPlan 2000, this regional bicycle/pedestrian plan brings together all of the elements of bicycle and pedestrian planning in the region.

The purpose of this plan is to set forth and elaborate on the bicycle and pedestrian goals and policies of the Metropolitan Area Planning Council and to provide basic technical information to communities as they undertake bicycle and pedestrian planning projects.

## **The Benefits of Bicycle and Pedestrian Travel**

The benefits of bicycle and pedestrian travel are many and are well documented in studies. In general, there are health and fitness benefits to the individual and society, in terms of improved health and through a decreased need to access costly health care services. These modes replace short distance motor-vehicle trips which tend to be the least fuel-efficient and most polluting per vehicle mile traveled.

As a congestion mitigation measure, bicycling requires less space per traveler than automobiles in terms of roadway space and parking. Therefore, greater use of non-motorized modes can decrease congestion

One important fact that is often overlooked is that roadway improvements that increase bicycle and pedestrian safety often improve safety for motorists by reducing conflicts. Studies cited in the National Bicycling and Walking Study have shown that adding a 4 foot wide paved shoulder on rural roads reduces several types of accidents by as much as 29%. Widening improvements can also slow the rate of roadway edge degradation which saves money in maintenance costs.

Off-road trails provide additional benefits. They can provide recreational opportunities, increase the value of abutting properties, generate income from tourism, protect environmentally sensitive corridors from development, aid in the protection of historical and cultural resources and spur economic revitalization.

### The National Context for Bicycling and Walking

**ISTEA** - The current interest in bicycling and walking as transportation modes is bolstered by the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). This piece of Federal legislation recognized the value of bicycling and walking and set new requirements for increasing the consideration of bicyclist and pedestrian needs. Funding is made available from a number of different sources for bicycle and pedestrian improvements.

**The National Bicycling and Walking Study** - The National Bicycling and Walking Study was mandated by the 1991 U.S. Department of Transportation Appropriations Act. The study consists of a report with an action plan and 24 case studies.

The study found that "A number of national surveys confirm that bicycling and walking are popular activities among Americans of all ages. An estimated 131 million Americans regularly bicycle or walk for exercise, sport, recreation, or simply for relaxation and enjoyment of the outdoors..." According to the 1990 Nationwide Personal Transportation Study, 7.2 percent of all travel trips are currently made by walking and 0.7 percent by bicycling."

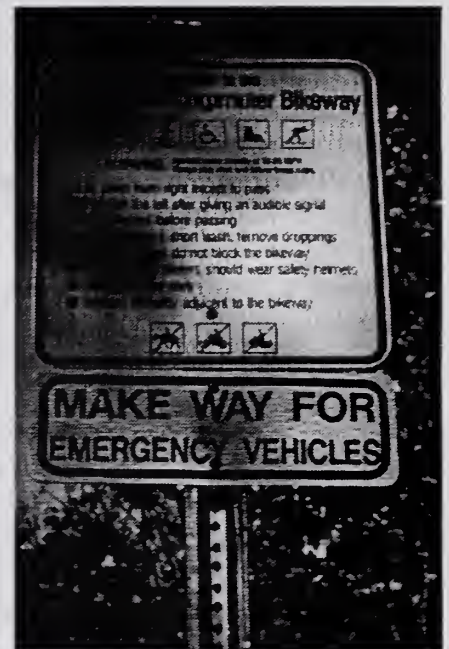


Figure 1: Paths can serve different users when basic "rules of the road" are followed. Source: MAPC

The National Bicycling and Walking Study set two major goals:

- ⇒ To double the current percentage (from 7.9% to 15.8%) of total trips made by bicycling and walking; and
- ⇒ To simultaneously reduce by ten percent the number of bicyclists and pedestrians killed or injured in traffic crashes.

## II. THE POLICY FRAMEWORK

### **The Transportation Element of MetroPlan 2000**

MAPC's officially adopted bicycle and pedestrian policies are found within the transportation element of MetroPlan 2000. One of the key goals of the transportation element is to improve options for auto-free commuting. The transportation element states that "the action recommendations for MetroPlan emphasize consolidating travel and demand in a strong economic core and to concentrated development centers. The hope is that in this environment, carpooling, van pooling, walking and bicycling, in addition to transit, will be feasible to a far greater extent than today." MetroPlan also makes reference to the potential for bicycling contributing to economic development as well as mobility.

Upon review of the transportation element, MAPC decided that the non-motorized portion of the element was worthy of further study. In September of 1993, MAPC convened an ad-hoc Bicycle Advisory Committee to assist in its efforts to develop a regional bikeway plan. In 1994, the committee was re-configured as a subcommittee of the MetroPlan Committee and was broadened to include pedestrians. The newly established Bicycle/Pedestrian Committee took on the task of revising the pedestrian portion of the plan.

The following bicycle and pedestrian policies and recommendations were adopted at the May 22, 1996 Council meeting.

### **Bicycle Policies and Action Recommendations**

#### **Action Recommendation T #4**

Increase the use of bicycles as a means of transportation by means such as removing barriers to bicycling; providing a range of facilities geared to a range of types of riders and by creating incentives for the increased use of bicycling, among others.

**Objective:** Work to create separate facilities for bicycles and pedestrians wherever feasible. Where this is not feasible, for example, on some multi-use off-road paths, take steps to prevent conflicts such as by striping the paths.

**Objective:** To have bicycling recognized as a legitimate mode of transportation and be fully integrated into the transportation planning process.

#### **Implementation:**

- A. Develop a regionally coordinated system of bicycle facilities, that maximizes the use of existing facilities such as roads, bridges and transit facilities, overcomes physical barriers, enhances safety for pedestrians, bicyclists and motorists, makes judicious use of abandoned and under-utilized corridors, promotes cost-effective solutions to pedestrian and bicyclist needs.
- B. Encourage all state transportation agencies to include a section on bicycle access in their plans, for individual projects as well as in overall planning documents.
- C. Evaluate the impacts of transportation projects on bicycle access as part of the regional review process.

**Objective:** To have bicycle access and use requirements be integrated into the design and review of sites, buildings and transportation facilities and laws at the state, regional and local level.

#### **Implementation:**

- D. Work with the MEPA (Massachusetts Environmental Policy Act) unit to incorporate bicycling design issues into all phases of the development review process. In this context, bicycling will be viewed as an effective means of mitigating traffic concerns.

- E. Ensure that bicycle access is included in the Memorandum of Understanding for every CDC (Concentrated Development Center).
- F. Work with communities to review their zoning, subdivision and site plan review bylaws as well as master plans to ensure that bicycle access is addressed.
- G. Work to create subdivision regulations to ensure that all streets in new developments are designed to ensure safety and access for bicycles.
- H. Ensure that the planning and design of new developments include consideration of bicycling as a form of travel. Encourage new developments to include facilities, appropriate for the type of development, which will facilitate bicycle use such as: bicycle lockers or other secure parking and showers for employees who choose to commute by bicycle

**Objective:** To increase bicycle use by providing a range of facilities and improvements to accommodate cyclists of varying abilities which takes into consideration different physical constraints and opportunities throughout the region.

**Implementation:**

- J. Identify a mix of priority improvements including both off-road facilities and on-road facilities and improvements.
- K. Ensure that all bicycle facilities and road improvements be designed, constructed and designated in accordance with the most up-to-date standards available at the time.
- L. Encourage all state agencies and local highway departments to design and construct all new roads and road improvements (including incidental improvements ) to provide for bicycle access, to the extent possible, regardless of whether or not that roadway has been identified as a priority route on the bicycle plan. All state agencies and local highway departments should also work to eliminate common safety hazards such as storm drains which run parallel to the road.



Figure 2: Bike lanes clearly delineate space for cars and bicycles. *Source: MAPC*

**Objective:** To have municipalities, the state transportation agencies, regional agencies and private entities share the responsibility for creating a more bicycle-friendly environment.

**Implementation:**

- M. Ensure that provisions for improved bicycle access are developed such as: bike racks and secure parking, pavement management decisions, master plans, major road improvements, separate facilities such as bike paths and, zoning bylaws including bicycle parking requirements.
- N. Work with municipalities to revise all local bylaws and regulations to include bicycle access.
- O. Incorporate bicycle design and access issues in all MAPC work with architects, designers and developers.
- P. Work to encourage and support bicycle safety and enforcement programs at the local and state-wide level as well as by private organizations. MAPC will help to disseminate information on such programs through the MAPC News and the subregions.



Figure 3: Pedestrians enjoying the Minuteman Commuter Bikeway. *Source: MAPC*

### **Action Recommendation T #5: Pedestrian Access**

**Objective:** Work to create separate facilities for bicycles and pedestrians wherever feasible. Where this is not feasible, for example on some multi-use off-road paths, take steps to prevent conflicts such as by striping the paths.

**Objective:** To plan and provide for walking as a legitimate mode of transportation fully integrated into the transportation planning process. Increase walking as a mode of transportation by means such as removing barriers to walking; by providing a range of facilities geared to a range of types of walkers; and by creating incentives for more people to walk, among others.

#### **Implementation:**

- A. Develop a coordinated system of pedestrian facilities and policies to maximize the use of existing roads, bridges, and transit; which systems overcome physical barriers, enhances safety, promotes cost-effective solutions.
- B. Encourage all state transportation agencies to include a section on pedestrian access for individual projects as well as in overall planning documents.
- C. Evaluate the impact of all transportation projects on pedestrian access as part of the regional review process.

**Objective:** To have pedestrian access and safe and legal walking be integrated into the design and review of sites, buildings, transportation facilities, and laws.

#### **Implementation:**

- D. Work with MEPA to incorporate walking design issues into all phases of the development review process.
- E. Ensure that pedestrian access is included in the Memorandum of Understanding for every Concentrated Development Center.

- F. Work with communities to review their zoning, subdivision and site plan review bylaws as well as master plans to ensure that access on foot is addressed. MAPC will disseminate this information.
- G. Work to create subdivision regulations to ensure that all streets in new developments are designed to ensure safety and access for pedestrians.
- H. Ensure that the planning and design of new developments include consideration of walking as a mode of travel. Encourage new developments to include facilities, appropriate for the type of development, which encourage pedestrian travel.

**Objective:** To increase walking by providing a range of facilities and improvements to accommodate walkers of varying abilities, ages, and disabilities which takes into consideration different physical constraints and opportunities throughout the region.

**Implementation:**

- J. Address infrastructure improvements for four season accessibility including pedestrian access to public transportation.
- K. Encourage state agencies and local highway departments to design and construct new roads and road improvements to provide for pedestrian access.
- L. Ensure that all pedestrian facilities meet the requirements of the Americans with Disabilities Act.

**Objective:** To have municipalities, state transportation agencies, regional agencies and private entities share the responsibility for creating better pedestrian circulation.

**Implementation:**

- M. Ensure that state agencies, transit agencies and local DPW's collaborate to improve pedestrian mobility in winter weather by sidewalk snow removal and ice-sanding in conjunction with street snow clearance.
- N. Ensure that provisions for a pedestrian-friendly off-street environment are developed, such as: toilets, wastebaskets, pay phones, trees, benches, transit access, control of sidewalk obstructions, and zoning by-laws that favor pedestrian pass-throughs. Signage can go a long way towards minimizing conflicts.
- O. Work with municipalities to revise all local by-laws and regulations to include review of developments, plans and proposals for their effect on pedestrian safety and the pedestrian environment.
- P. Include the compilation of pedestrian accident statistics a priority for the Registry of Motor Vehicles and the Public Health Department.
- Q. Incorporate pedestrian design and access issues in all MAPC work with architects, designers and developers.
- R. Support pedestrian safety and enforcement programs at the local and state level as well as by private organizations.
- S. Improve pedestrian access to public open space in the region by improving transit connections. Encourage adjacent communities to publicize transit connections in other jurisdictions, so a person can walk a trail and ride back.
- T. Reduce auto dependence in the MAPC region through transit and coordinated development that encourages walking.

### **III. THE REGIONAL BICYCLE SYSTEM**

#### **The Components of a Regional Bicycle System**

A comprehensive regional bicycle system consists of physical as well as non-physical elements. In bicycle transportation planning, it is common to talk about the four *E*'s of a bicycle transportation system: **e**ducation, **e**ncouragement, **e**ngineering, **e**ncouragement.

**Engineering** involves such things as hazard removal, roadway improvements, barrier and bottleneck elimination, on-road bikeway development, and bicycle trail development. Engineering also includes the planning necessary to develop a coherent system of facility improvements.

**Encouragement** activities could include promoting land use patterns that shorten trip distances, bike to work days, recreation programs, parking ordinances, bicycle mapping and media campaigns.

**Education** includes in-class instruction, on-bike training, adult education, driver training and awareness campaigns. The League of American Bicyclists has an extensive education program called "Effective Cycling." Additional information on education can be found in the Massachusetts Statewide Bicycle Transportation Plan (Chapter Four).

**Enforcement** programs involve basic traffic law enforcement, warning programs for children, target enforcement, accident statistic compilations and bicycle patrols.

This plan focuses on engineering and encouragement because these are areas that are within the realm of MAPC's roles and responsibilities, as a regional planning agency. While education and enforcement are critical parts of the system, these are areas that other agencies and organizations are better equipped to deal with.

In order to present the existing conditions and future needs of the regional bicycle system, six major areas will be dealt with. These are: designated bicycle facilities, shared roadways, bicycle parking, initiatives that encourage bicycling, inter-modal access, and land use considerations.

#### **Key Concepts Related to Meeting the Future Needs of the System**

As noted earlier, the existing collection of bicycle facilities and programs within the MAPC region cannot be considered a "system." The next few sections discuss what needs to be done in order to create a regional bicycle transportation system. These sections discuss some key concepts in bicycle planning and identify the physical facilities and programs that are necessary to create a region where bicycling is a safe and convenient form of transportation and recreation.

#### **Institutionalizing Bicycle Planning**

The most important concept in bicycle planning is that of "institutionalization." Isolated efforts by local or state officials and citizen activists will not achieve the goal of creating a bicycle system. According to The National Bicycling and Walking Study, institutionalization "refers to the ongoing integration of bicycling (and walking) considerations into the routine working of all levels of government agencies or, in certain cases, the private sector."

Institutionalization is explained in more detail in the final report of the National Bicycling and Walking Study, page 55. The regional bicycle/pedestrian plan seeks to institutionalize the consideration of bicycle accommodations at all levels where design, funding and construction decisions are made.

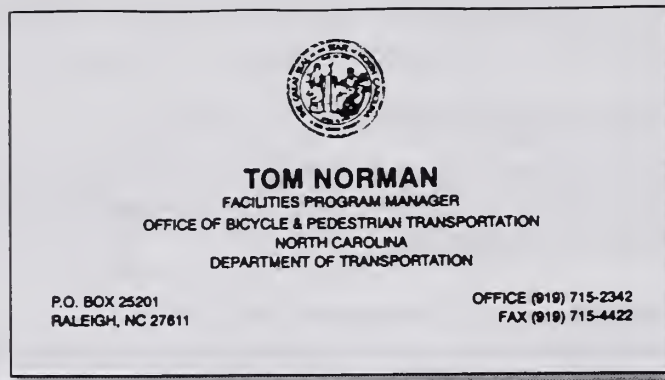


Figure 4: Staffing is critical to a successful program

## Liability

The issue of liability is frequently raised when municipalities are considering bicycle facilities. Many municipalities have expressed concern that providing bicycle facilities will increase their potential liability. Municipal liability for bicycle facilities is the same as for any other municipal facility or service. The most prudent approach is to follow current design standards and to maintain roadways and bicycle facilities in good condition. The APA report on Bicycle Facility Planning identifies nine specific aspects of roadway/ bicycle infrastructure design that can lead to liability:

- ⇒ lack of maintenance
- ⇒ steep downgrade slopes
- ⇒ inadequate curve radii
- ⇒ sight obstructions
- ⇒ too narrow a bike path
- ⇒ lack of warning signs
- ⇒ designating a sidewalk as a bikeway
- ⇒ misuse of bike route signs
- ⇒ poor handling of bicycle lanes with right-turning vehicular lanes

This report also notes that bicyclists are legitimate roadway users and that local governments have a responsibility to ensure that conditions on the roadways are safe for bicyclists.

## Key References

- 1) **Bicycle Facility Planning, American Planning Association, Report #459, Page 38**

## Determining the Appropriate Type of Facility

Because conscious planning for bicycle accommodations is new to many municipalities and agencies, it is important to understand the key concepts behind facility selection. The basic concepts can be summarized as follows:

- 1) There are three classes of design bicyclists; group A (advanced), group B (basic), and group C (child).

- 2) A policy goal of increasing use implies a supply-driven approach—"if you build it, they will come."
- 3) Every street and highway should be designed and maintained for shared use by motor vehicles and bicycles.
- 4) Facilities for group B/C cyclists can be identified through a planning process and design decision.
- 5) Special facilities provided for B/C cyclists are additions to the existing system, not substitutes for shared use of the roadway. (Bicycle Safety-Related Research Synthesis, FHWA-RD-94-062, Page 70).

There are two documents which provide detailed information on how to select and design the appropriate type of bicycle facility for a wide range of roadway and traffic conditions and for different types of bicyclists. The first document, "Guide for the Development of Bicycle Facilities" was published in 1991 by the American Association of State Highway and Transportation Officials (AASHTO). It presents guidelines to help accommodate bicycle traffic in many different riding environments. There is a list on pages 8-9 that describes seventeen factors which should be taken into consideration when selecting the type of facility or improvement needed. The second document is "Selecting Roadway Design Treatments to Accommodate Bicycles" published by the Federal Highway Administration. Pages 16-21 includes 6 tables that evaluate the conditions under which wide curb lanes, shoulders, shared lanes and bike lanes are most appropriate depending on the speed of traffic, sight distances, average annual daily traffic, the mix of vehicle types, urban or rural land uses, parking and the type of cyclist.

The Oregon Bicycle and Pedestrian Plan (Page 71-72) has a list of practices to be avoided, based on over 20 years of experience designing bikeways.

The practices to be avoided include:

- 1) Sidewalk bikeways.
- 2) Extruded curbs.
- 3) Reflectors and raised pavement markers.
- 4) Two way bike lanes.
- 5) Continuous right-turn lanes.

These three documents are a useful starting point for evaluating what types of improvements might work on specific roadways. The final decision will need to be made after a careful review of local conditions, demand, costs and feasibility.

**Design Cyclists** - The concept of the "design cyclist" is often used in bicycle transportation planning to distinguish between the different needs of different types of bicyclists. However, the concept is being used less often as more communities design facilities to serve all users. The following definitions are frequently used:

**Group A - Advanced Bicyclists:** Experienced riders who can operate under most traffic conditions and who desire direct routes and high speeds.

**Group B - Basic Bicyclists:** Casual or new adult and teenage riders who desire low-speed, low volume



Figure 5: Group A Advanced Cyclist  
Source: MAPC

streets or designated bicycle facilities.

**Group C - Children:** Pre-teen riders whose key destinations are within or adjacent to residential areas, prefer low volume streets with slow traffic or clearly defined separate bike paths.

One of the stated objectives of MAPC's bicycle policy is to "increase bicycle use by providing a range of facilities and improvements to *accommodate cyclists of varying abilities...*" The overall policy goal therefore, is to serve Group A, B and C cyclists, so projects or facilities should be designed and built with all cyclists in mind.



Figure 6: For children, bicycling is an important means of transportation. Source: MAPC

## Types of Trips

The primary source of information on bicycling and walking trips is the Nationwide Personal Transportation Survey (NPTS) which is conducted every seven years. The 1990 survey found that only one out of five trips of all kinds involve travel to or from work. Approximately 42% of all trips are family or personal business travel. Another 25% are social or recreational. The survey found that 0.7 percent of all trips were by bicycle. This amounts to an estimated 1.7 billion bicycle trips made in 1990 (The National Bicycling and Walking Study, page 11). Of these, 9.9% were work-related, 19.7% were for personal or family business, 55.4% were social or recreational, 14.1% were for school, church or civic purposes. The average trip length for bicycle trips was 2.0 miles. The NPTS also found that 39.6% of all auto trips are two miles or less, and 48.8% are three miles or less. Based on trip distance alone, it appears that many more trips could be made by bicycle.

**Types of Bicycle Facilities** - It is important to use consistent terms when referring to bicycle facilities because there are terms which are frequently used interchangeably but that do have significant differences. The most commonly used definitions are taken from the American Association of State Highway and Transportation Officials (AASHTO). There are also bicycle facilities as defined by Massachusetts law. Differences between the Massachusetts definitions and AASHTO definitions are shown in *italics*.

### **Bicycle:**

Massachusetts: A two-wheel nonmotor-powered vehicle.

AASHTO: A vehicle having two tandem wheels, either of which is more than 16" in diameter, or having three wheels in contact with the ground, any of which is more than 16" in diameter, propelled solely by human power, upon which any person or persons may ride.

The Massachusetts definition does not take into account tricycles such as those used by children or by people with disabilities.

### **Bicycle Facilities:**

AASHTO: A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, mapping all bikeways, and shared roadways not specifically designated for bicycle use.

Although most bike paths and lanes are public facilities, other bicycle facilities such as parking, maps, educational programs, and paths within private developments, may be built and maintained by the private sector.

**Bike Lane:**

Massachusetts: A lane on a street *restricted* to bicycles and so designated by means of painted lines, pavement coloring or other appropriate markings.

AASHTO: A portion of a roadway that has been designated by striping, signing, and pavement marking for the *preferential or exclusive* use of bicyclists.

**Bike Path:**

Massachusetts: A route for the *exclusive* use of bicycles separated by grade or other physical barrier from motor traffic.

AASHTO: A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way.

**Bike Route:**

Massachusetts: A roadway shared by both bicycles and other forms of transportation designated by the means of signs or pavement markings.

AASHTO: A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without a specific bicycle route number.

**Bikeway:**

Massachusetts: Bike paths, bike lanes and bike routes.

AASHTO: Any road, path, or way that in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

**Shared Roadway:**

AASHTO: Any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether such facility is specifically designated as a bikeway. All roads except limited access highways are shared roadways.

**Bicycle Parking Facility:**

Massachusetts: Any facility for the temporary storage of bicycles which allows the frame and both wheels of the bicycle to be locked so as to minimize the risk of theft and vandalism.

## **Inventories and Surveys**

The existing collection of bike paths, roads, bike lanes and bicycle parking facilities cannot be considered to be a system. The existing bicycle facilities in the region are, for the most part, a collection of un-related improvements undertaken primarily at the local level or by various agencies in response to specific opportunities as they present themselves. While individual facilities may be useful and well-designed, a much more coordinated effort is needed to maximize the utility of these facilities.

Until recently, there was very little information available about the extent of bicycle facilities throughout the state and the region. Two recent surveys have provided some information about what bicycle facilities exist although both surveys were necessarily limited in the information they were able to collect.

**MAPC Municipal Survey** - In order to better understand what municipalities were doing to promote bicycle use, MAPC sent a survey to all 101 cities and towns in the region. The survey was sent to town administrators, city and town planners, town managers, executive secretaries, MAPC representatives and local highway departments or departments of public works. The survey was conducted in the winter of 1994 and reflects conditions at that time. The response rate was 54%. The majority of respondents were planners (21 responses) followed by town administrators or managers (10 responses). Responses were also received from 9 engineers or highway departments.

At least 9 communities had either a municipal or citizen's bicycle committee and an additional 21 communities said that there was interest in forming such a committee. Bicycling was considered in the open space or master plans of 26 communities and others indicated that it would be in future planning efforts although few communities had specific bicycle plans. Twenty-six communities said that they were planning for some type of bicycle facilities.

As far as existing facilities, 8 communities reported that they have bike lanes, 19 reported bike paths and 11 reported bike routes. Fifteen communities reported that their Department of Public Works does get involved in planning for bicycle facilities but to varying degrees.

***The Statewide Bicycle Facilities Inventory*** - During the winter and spring of 1995, the Executive Office of Transportation and Construction (EOTC) hired the Bicycle Coalition of Massachusetts (BCOM) to conduct a statewide inventory of existing and proposed bicycle facilities. Four public meetings were held in the MAPC region to solicit information on facilities and an additional four meetings were held to present and review the data. The inventory represents the first statewide attempt to catalog existing facilities and to solicit ideas for future facilities. Due to the way in which the data was solicited and categorized, it is difficult to use it to present a comprehensive overview. The inventory contains separate entries for every suggestion that was submitted, even if several people submitted the same project. Some of the suggestions submitted were conceptual and lacking in any detail. Because bicycle parking tends to be very local and dispersed, many facilities were not included. In addition, some existing and proposed facilities may not have come to the attention of the project staff. However, it is a useful starting point for understanding the overall extent of bicycle facilities and needs in the region.

## **Designated Bicycle Facilities**

### **A. Existing Facilities**

This section describes the existing facilities that are designated solely for bicycles or other non-motorized modes in the Boston Metropolitan Planning Organization (MPO) area. This includes bike lanes on existing roadways and bike paths (paths that are physically separated from vehicular traffic). This information is taken from the Commonwealth of Massachusetts Bicycle Facilities Inventory.

*Emerald Necklace Bicycle Paths* - Many of the bridge paths and promenades of the Olmsted park system have been recast as multi-use trails, under the management of the MDC. The paths along the Riverway and Jamaica Way appear to be the most heavily used of these.

*Dr. Paul Dudley White (Charles River) Paths* - Walkways along the Charles River in Cambridge and in Boston's Back Bay were reconstructed as bicycle paths in the early 1970's. These were extended upriver to Watertown on both sides of the river in 1980. A "Riverwalk" which is used by bicyclists was built in the early 1990's along the waterfront in Waltham.

*Lallement (Southwest Corridor) Bicycle Path* - This path lies above Amtrak rails and the relocated Orange Line subway, between Back Bay Station and Forest Hills Station in Boston. The path was constructed in the late 1980's.

*Other paths in MDC reservations* - Designated bicycle paths also exist in the Mystic River Reservation in Medford and Somerville, and in the Stony Brook Reservation in the Hyde Park area of Boston. Bicycling is permitted on the wide walkways along the South Boston waterfront and the Lynn oceanfront. The Riverwalk recently constructed along the Charles River in Waltham is used as a bicycle path. An unpaved path exists between Alewife Station and Brighton Road in Belmont.

*Minuteman Commuter Bikeway* - Completed in the early 1990's, this path extends from Arlington to Bedford. It connects with the Alewife Red Line subway station via a narrower, temporary sidewalk. In 1996, the portion to the station will be constructed.

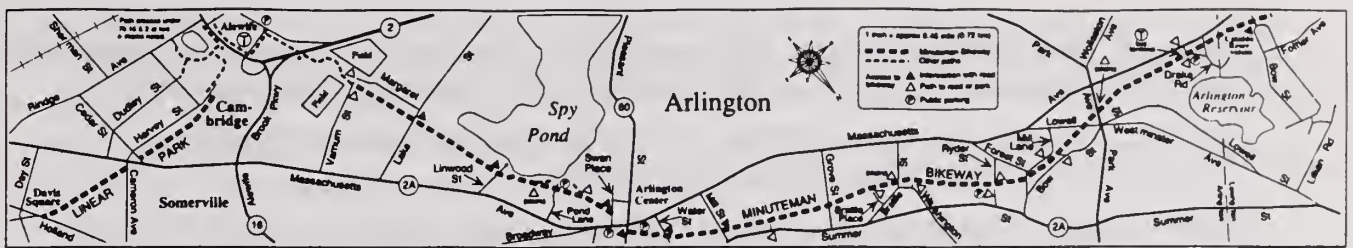


Figure 7: Map of the Arlington section of the Minuteman Commuter Bikeway

Source: Friends of the Minuteman Bikeway brochure

*Recent Cambridge Initiatives* - The City of Cambridge has constructed and planned several bicycle facilities throughout the city. Where roadways are being renovated or reconstructed, street rights of way are reevaluated and bicycle lanes or edge striping are included, depending upon available roadway width and type of street. Examples of edge striping include Broadway, River Street and Brattle Street. Bicycle lanes have been striped on several streets, including Huron Avenue and Sparks Street and a segment of Mt. Auburn Street. Bicycle lanes are planned for Massachusetts Avenue, Quincy Street and several other locations. In addition, the Minuteman Commuter Bikeway will be extended to the Alewife MBTA station in 1996 and design work is underway for connecting Alewife Brook Parkway to Fresh Pond Reservation and Huron Avenue along the Fresh Pond Parkway corridor. The City is also undertaking a number of traffic calming projects on residential streets; these will be of benefit to bicyclists and pedestrians.

*Lexington bicycle routes and paths* - The Town of Lexington has several designated shared roadway bicycle routes and off-road paths. Lexington also has designated bicycle lanes along Worthen Road between Waltham Street and Bedford Street.

*Salem bicycle paths* - Salem has recently completed a pathway on an abandoned railbed. Others are under construction or proposed.

*Aberjona River Bikeway* - Winchester has several segments of pathways along the Aberjona River.

*Lincoln* - There are designated bicycle paths adjacent to Codman Road and Route 126 in Lincoln.

*Hingham-Hull Path* - This is partially completed and runs adjacent to Washington Street, the main access route to the Hull peninsula.

## B. Future Facilities

This section describes potential facilities that are designated primarily for bicycles or other non-motorized modes. This includes bike paths (paths that are physically separated from vehicular traffic) and bike lanes on existing roadways. These projects range from those that are actively in planning, design or construction as well as projects which are still in the conceptual stage.

One of the objectives of the MAPC Bicycle Policy is to "increase bicycle use by providing a range of facilities and improvements to accommodate cyclists of varying abilities..." Off-road trails are an important part of a comprehensive network of bicycling and walking facilities. The benefits of off-road trails are described in Case Study No. 7: Transportation Potential and Other Benefits of Off-Road Bicycle and Pedestrian Facilities of the National Bicycling and Walking Study. Among the benefits listed are the following:

*Transportation:* Trails can increase the percentage of bicycling and walking commuter and utilitarian trips, improve safety, increase access and promote intermodal travel. The case study noted that in the Chicago area, census zones where linear trails existed averaged 15.6% of commuter trips by bicycle compared with 1% for the region as a whole.

*Recreational:* Trails are an easily accessible form of outdoor recreation.

*Economic:* Trails have been found to increase real estate values, generate income from shared utility leases, increase spending from tourists and trail users, and generate jobs for trail maintenance.

*Planning:* Trails and greenway corridors can protect parkland, aid in wetland protection and preserve undeveloped land, separate and buffer land uses.

*Environmental:* Trails can promote wildlife preservation, water quality protection, storm water management and, preservation of vegetation.

*Historic and Cultural:* Trails provide a means to increase awareness of the history and culture of a region and aid in the preservation of historic sites.

*Quality of Life Benefits:* Trails can preserve community character and foster community pride, aid economic revitalization, provide access to the outdoors and increase mobility.

Within the MAPC region, the opportunity exists to create an extensive network of off-road bicycle facilities. The popularity of the Charles River Bike Paths and the Minuteman Commuter Bikeway are indications that there is a demand for additional paths. A network of paths could be created that provide east-west routes as well as north-south routes and would provide access to town centers, transit, schools, shopping, parks and conservation lands. These paths could stimulate economic activity, increase tourism, preserve transportation corridors, provide opportunities for children, novice cyclists and wheelchair users to travel safely and increase bicycling on the larger road network by acting as a training ground to create more confident cyclists. The costs and benefits of these facilities will be reviewed in the chapter on implementation. The purpose of this section is to provide information on the opportunities that exist within the region to create a network of paths. This section briefly describes most of the active projects and proposals but is by no means a complete list.

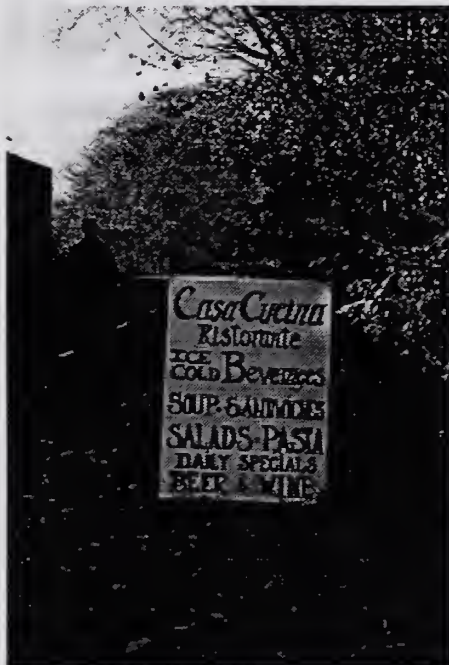


Figure 8: A local business targets advertising to bikeway users.

Source: MAPC

Although the term bike path is used here because these paths are being presented in the context of a bicycle/pedestrian plan, they should be thought of as multi-use paths because they will likely be used by a variety of non-motorized modes. As facilities are being planned and designed, consideration should be given to separation of different users.

1) *Minuteman Extension East (Arlington/Cambridge)* - This project involves widening and upgrading the existing path that leads from the end of the Minuteman Commuter Bikeway to the MBTA station. This project is underway.

2) *Minuteman Extension West* - This project would extend the Minuteman Commuter Bikeway west into Concord. Because it would pass through the wetlands of the Great Meadows Wildlife Sanctuary, there is the possibility that the extension would be improved but not paved. This project is under consideration but is not in the active planning or design stage.

3) *Minuteman Extension North (Bedford/N. Billerica)* - This right-of-way is owned by the towns and is used as a trail by mountain bikes.

4) *Minuteman - Charles Connector* - The Central Transportation Planning Staff (CTPS) is currently completing a study of ways to connect the Minuteman Commuter Bike Way with the Charles River system. A number of potential off-road facilities are being evaluated. These include:

- a. The Watertown Branch - This railroad right-of-way runs from Fresh Pond in Cambridge to Arsenal Street in Watertown. The right-of-way is partially in use. A portion of the right-of-way from Main Street to the Waltham line has been filled in. This project is included in the 1996 Open Space Bond Bill.
  - b. Cambridge Bikeway Fresh Pond Parkway West - A new bicycle path will be constructed along the edge of the parkway to provide better access to Fresh Pond Reservation.
  - c. Kingsley Park Bridge - Cambridge - This project involves a new bridge with improved bicycle access and improvements to the sidewalk that runs from the bridge to Huron Avenue along the west side of Alewife Brook Parkway. This bridge is the entrance to Fresh Pond Reservation.
  - d. Cambridge Bikeway to Linear Park - This project would improve the existing five foot wide path that runs from the Alewife T station to the Red Line Linear Park and North Cambridge.
  - e. Cambridge Bikeway on Fitchburg Rail Line - This improvement consists of adding a footbridge to improve access to the gravel path known as the Fitchburg cut-off.
  - f. Central Somerville - This would be a continuation of the mostly completed Grove Street to Cedar St. bikeway, paralleling abandoned and active freight spurs and a rails with trails (MBTA Lowell Line) to the New Charles River Basin in Cambridge.
  - g. Alewife/Mystic - This would involve a new bike path following the Alewife Brook and Mystic River shorelines from Arlington to Medford Square with potential extensions to existing Mystic River paths in Medford and Somerville. The MDC will be releasing a Master Plan for the area in the spring of 1996.
  - h. Somerville/Charlestown - This would involve a new path along the Mystic River/MBTA bus yard connecting the existing MDC Draw Seven Park to Sullivan Square in the vicinity of the Schraffts office building.
- 5) *Red Line Linear Park Extension* - This project extends the Red Line Linear Park from Davis Square along an abandoned rail corridor to Cedar Street in Somerville. This project is underway.
  - 6) *Charles River Bikepath Extension East* - The MDC is currently studying ways to extend the bikepath to the harbor as part of the planning for the New Charles River Basin Park.
  - 7) *Charles River Bikepath Extension West* - The MDC is studying ways to extend the path beyond Watertown Square.
  - 8) *Boston- Riverway Extension to Kenmore* - This project would involve extending the Riverway bike path along the west bank of the river to Kenmore Square along an unused rail line.
  - 9) *Jamaica Pond to Forest Hills* - This project would create a bike path or bike lanes along Route 203 to connect the Jamaicaway with the Lallement Memorial path.
  - 10) *Assabet River Rail Trail* - This trail would run from Marlborough to the South Acton commuter rail station passing through four towns and connecting with the Central Massachusetts trail. A feasibility study of this project is underway. Another project, a path using the inactive MBTA Maynard spur, would run from the Route 27 bridge in S. Acton, cross Mill Pond and continue to the Maynard town line.
  - 11) *Bike to the Sea* - This path would connect Lynn, Malden, Saugus, Medford, Everett and Revere. It would have connections with the Orange line and the Blue line of the MBTA as well as the commuter rail station. A feasibility study for this project will soon be completed. This project has been included in the 1996 Open Space Bond Bill.
  - 12) *Border to Boston Trail* - This trail has both an on-road and off-road component. The off-road compo-

nent would utilize an abandoned railroad right-of-way beginning in Salisbury and ending in Danvers. The off-road component of this project has been included in the 1996 Open Space Bond Bill.

- 13) *Central Massachusetts Trail* - This would be an approximately 22 mile trail on an abandoned railroad right-of-way running from Waltham west to Hudson and beyond the MAPC region to Clinton, roughly paralleling Route 20. It would connect with the Lowell-Sudbury trail and would be the major east-west route in the regional system. A feasibility study for this project is scheduled to begin in the spring of 1996. This corridor is also being studied for potential commuter rail service.
- 14) *Lowell to Sudbury* - This 20.2 mile trail would include 12.6 miles in four MAPC communities. It would be the major north-south route and would connect with the Central Massachusetts trail. A feasibility study for this project was completed in 1987. Phase I of preliminary design work has been completed on the northernmost seven miles (outside of the MAPC region). The Town of Concord has identified the portion of the trail from the West Concord Depot to the Sudbury town line as being a priority for development.
- 15) *Upper Charles (MetroWest/SWAP) Bikeway* - This project would create a bike path on a railroad right-of-way through Framingham, Sherborn, Holliston, Milford, Hopkinton and Ashland, connecting conservation lands, suburban work locations and the Framingham commuter rail station. A feasibility study is scheduled for later in 1996. There is some local interest in commuter rail service on this corridor although the MBTA has no plans for service at this time.
- 16) *Sudbury Aqueduct* - This path would extend from Newton Center to Framingham along the MWRA's aqueduct. This project is in the conceptual stages only and there is no feasibility study planned at this time.
- 17) *Norwood/Providence* - There is an abandoned railroad right-of-way from Norwood to Providence. This right-of-way is being considered for part of the East Coast Greenway although there are no studies planned at this time. East Coast Greenway Alliance (ECGA) is an organization that is attempting to create a city to city multi-use trail between Boston and Washington DC.
- 18) *Tri Community Bike Path* - This path would connect Woburn, Stoneham and Winchester. The three communities have recently begun to plan for this project.
- 19) *Peabody* - This is a three part trail system with potential connections to Middleton and North Reading. It would consist of a 7.2 mile long greenway from the eastern border with Salem to its western border with Middleton and Lynnfield. The city is actively pursuing this project.
- 20) *MBTA Fitchburg Line* - This would be a rail-with-trail project paralleling the active MBTA Fitchburg line from West Acton through S. Acton to West Concord.
- 21) *Riverside Park/Newton Lower Falls* - This one mile path on an abandoned railroad right-of-way will extend from Riverside Park to Newton Lower Falls.
- 22) *Salem* - This potential bike path would be constructed in three phases and would have connections to bike paths in Peabody and Marblehead.
- 23) *MDC- Neponset to Dorchester* - The MDC is proposing to build a 1.75 mile path from Neponset Circle to Dorchester Lower Falls.
- 24) *East Boston Greenway* - This Conrail railbed is being donated to the Trust for Public Land and Boston Natural Areas Fund for creation of a pathway that would link Massport's Piers Park with Wood Island and Belle Island Marsh.

- 25) *Southcove Harbor Trail* - This project involves connecting the Fort Point Channel with the Boston University Medical/Research area and the South End. Using underutilized former industrial sites and other transportation rights-of-way it will connect the Central Artery and downtown with the Southwest Corridor and Emerald Necklace.

### **C. Needs and Recommendations for Bicycle Paths**

The projects described above would create an extensive network of bike paths covering a large portion of the region with the exception of the South Shore. North of Boston, the combination of the Bike to the Sea and the Border to Boston trail would create a major north-south path in the eastern portion of the region.

The Central Massachusetts trail would function as a major east-west link through the center of the region. In combination with the Assabet River Rail Trail, the Minuteman extension to the west and the Lowell-Sudbury path, these four paths would create a network covering the northwest portion of the region.

The southwestern portion of the region would be served by the Upper Charles bike path and the Sudbury Aqueduct.

The south shore is the area where there is very little activity in bicycle planning at this time. The East Coast Greenway Alliance (ECGA) is an organization that is attempting to create a city to city multi-use trail between Boston and Washington DC. They are interested in the Norwood-Providence railroad right-of-way as part of the greenway. There are no bike path proposals on the south shore.

### **D. Bike Lanes**

A bike lane is a portion of a roadway that has been designated by striping, signing, and pavement marking for the preferential or exclusive use of bicyclists. Bike lanes are used in situations when it is desirable to allocate available roadway space for use by bicyclists. Currently, there are very few bike lanes in the region.

A report published in 1995 by the Federal Highway Administration documented the benefits of bike lanes. Studies show that automobiles and bicyclists behave more predictably with less side-to-side movement when bike lanes are present. Bike lanes have been found to decrease accidents and increase bicycle ridership. The report cites a number of studies that report that potential bicyclists as well as novice bicyclists want a designated space to ride in and do not feel comfortable riding directly in the flow of traffic. These studies also report that bicycle commuting is highest in cities with more bike lanes per roadway mile.

Some states such as Oregon have adopted a policy that bike lanes are the preferred bicycle accommodation for busy roadways in urban areas. Oregon has chosen bike lanes over shared roadways with a wide outside lane for the following reasons:

- ⇒ Bike lanes indicate to bicyclists and drivers what space is designated for each user.
- ⇒ They encourage bicyclists and motorists to respect each others right to the road by treating each mode equally and making movements predictable.
- ⇒ Bike lanes "invite" potential or less experienced riders by indicating that there is room on the road for them.

The Oregon Bicycle and Pedestrian Plan states that bike lanes should be provided on arterials and major collectors because these roads link neighborhoods, provide access to all destinations and require bicyclists to stop and yield less often than on other roads. The decision to create a bike lane

on a particular road needs to take into account a number of factors that vary from road to road. Bike lanes are most successful when there is a complete network as opposed to a few isolated lanes.

Once the decision to create a bicycle lane has been made, it is important to design these lanes according to the most recent standards. Because intersections are the most dangerous, particular attention needs to be paid to lane markings through intersections. Information is available from the Oregon Department of Transportation on how to retrofit bike lanes onto existing urban roadways. This has been done recently in Cambridge.

**Recommendation:** Communities should review all their arterials and major collectors to determine which roads are a priority for bike lanes. This should be done in the context of a comprehensive review of bicycle accommodation needs at the local level. When roads are due for resurfacing, they should be evaluated to determine if a bike lane is appropriate and feasible.

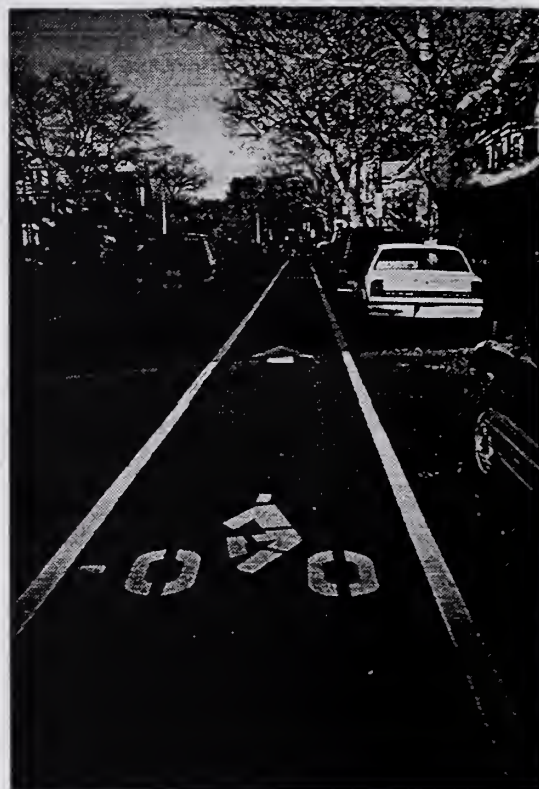


Figure 9: In Cambridge, roads have been restriped to add bike lanes. Source: MAPC

#### Key References








- 1) **Bike Lane or Shared Roadway?, Pro-Bike News, 1993**
- 2) **Retrofitting Bike Lanes onto Existing Urban Roadways, Oregon Dept. of Transportation.**
- 3) **Bicycle Safety-Related Research Synthesis, FHWA, 1995, Pages 80-84.**

# MAPC Regional Bicycle And Pedestrian Plan





26-Feb-97

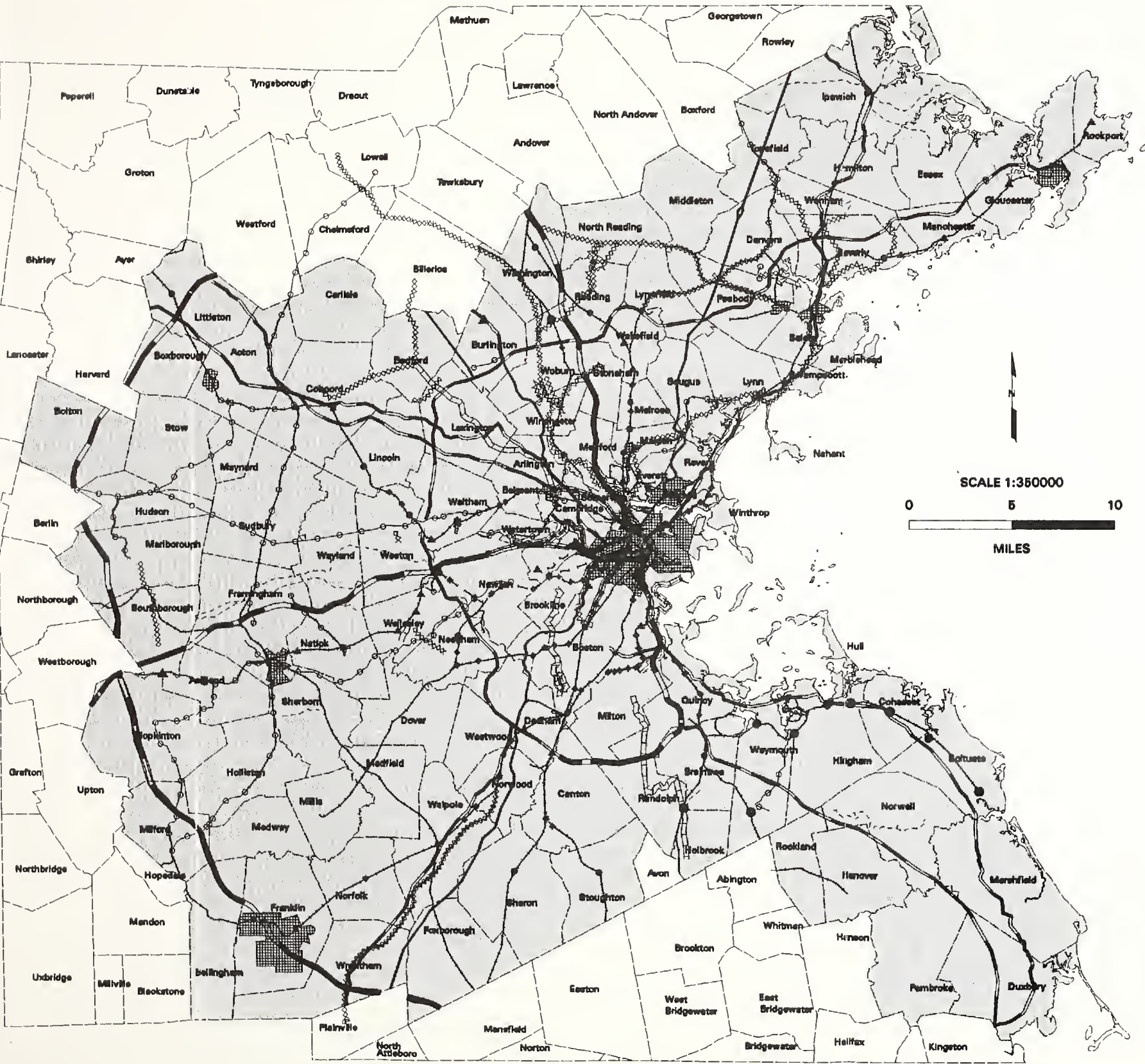
## LEGEND

### Priority Level Potential Facilities

-  HIGH
-  MEDIUM
-  LOW
-  Existing (No Priority)
-  MBTA Commuter Rail and  
Subway Lines  
(Active and Inactive)
-  Town Boundaries
-  Concentrated Development Centers  
(includes Urban Economic Core)

### Bicycle racks at Transit stations

-  HIGH
-  MEDIUM
-  LOW
-  Under Construction  
Or Proposed



The information depicted on this map is for planning purposes only.  
It is not adequate for legal boundary definition, regulatory  
interpretation, or parcel-level analysis.

Produced by the Metropolitan Area Planning Council GIS Lab.  
60 Temple Place, Boston, MA 02111 (617) 451-2770



## Shared Roadways

### A. Existing Conditions

The largest component of the regional bicycle system consists of shared roadways. A shared roadway is any roadway which may be legally used by bicycles regardless of whether the road is specifically designated as a bikeway. Shared roadways include those which have designated bicycle lanes. The majority of roads can be classified as shared roadways because Massachusetts law states that all public ways are open to bicycle use except for posted, limited access highways. The existing road network varies tremendously with regard to its suitability for bicycle use in terms of lane width, design of intersections, traffic volume and speed, availability and quality of a shoulder and pavement quality. It is anticipated that shared roadways will continue to constitute the largest part of a regional bicycle transportation system. Cyclists desire access to the same destinations as motorists and the existing road network provides far more coverage of the region than a network of bicycle paths can. Bicycle accommodations can be included in all roadway improvement projects or new roads. It is important to bear in mind that shared roadways (with or without specific on-road accommodations), will serve primarily adult cyclists for a variety of trip purposes. Shared roadways, except for low traffic residential streets, will not be suitable for most children, even with better education for both children and motorists.

Various maps have attempted to identify roads that are safer or more scenic for bicyclists. These maps are described in the section on mapping on page 24.

The introduction to the Commonwealth of Massachusetts Bicycle Facilities Inventory notes that the inventory of roadway facilities, by its nature, cannot be comprehensive. This is because most roadways in Massachusetts are legally open to bicycles and only a small portion of these were submitted for inclusion in the inventory. Most of the roadways that were included in the inventory were either described as good bicycle routes or as roads in need of significant improvements because of current bicycle use. Several on-road bicycle routes were highlighted as described below.

*Norwood bicycle routes* - Norwood has on-street bicycle routes designated in the 1970's and with signage that is still maintained.

*Lexington bicycle routes and paths* - The Town of Lexington has several designated shared roadway bicycle routes and off-road paths. Lexington also has designated bicycle lanes along Worthen Road between Waltham Street and Bedford Street.

*Boston to Cape Cod bicycle route (Claire Saltonstall Bikeway)* - The Boston end of the Boston to Cape Cod route, Massachusetts Bicycle Route 1, follows existing paths and streets between Back Bay and Hyde Park, continuing south through Milton, Canton, Randolph and Holbrook.

### B. Future Needs

It is important to bear in mind that shared roadways (with or without specific on-road accommodations), will serve primarily adult cyclists for a variety of trip purposes.

Because bicycles will be ridden on all highways where they are allowed, (the most common exclusion is limited access highways) all new roads and roadway improvement projects need to be designed and constructed following bicycle-safe design practices. This includes but is not limited to the following:

- ⇒ Bicycles lanes, wide curb lanes or wide paved shoulders
- ⇒ Drainage grates that do not trap bicycle wheels and are flush with the pavement
- ⇒ Railroad crossings where the tracks are at right angles to the road or where there is sufficient road width for cyclists to cross at a right angle.
- ⇒ Pavement surfaces that are free of irregularities

- ⇒ Bicycle sensitive traffic signal actuators
- ⇒ Bridges and tunnels need to be designed so that deck surfaces, approaches and lighting take bicycles into consideration.

In addition, roadway maintenance practices such as street sweeping and pothole repair need to be considered.



Figure 10: This bridge was restriped to include wider shoulders. *Source: Oregon Bicycle and Pedestrian Plan*



Figure 11: Extremely undesirable condition. *Source: Oregon Bicycle and Pedestrian Plan*

### Key References

**North Carolina Bicycle Facilities Planning and Design Guidelines, Pages 17 - 27.**

**Case Study No. 24: Current Planning Guidelines and Design Standards Being Used by State and Local Agencies for Bicycle and Pedestrian Facilities, Pages 28 - 43.**

**MAPC Road Improvement Policy** - Currently, most bicycle accommodations occur because of local citizen action. The regional bicycle/pedestrian plan seeks to institutionalize the consideration of these accommodations at all levels where design, funding and construction decisions are made.

MAPC has adopted a policy on roadway accommodations. Pursuant to the recommendations of the Transportation Element of Metro-Plan 2000, it is MAPC policy that all roadway design, construction and reconstruction in the region (except on limited access highways) should consider the appropriate accommodations for safe bicycle access. MAPC recommends that all cities and towns adopt similar policies that encourage the consideration of bicycle accommodations at the earliest stage in planning and design. Bicycle accommodations should be included as early as the 25% design.



Figure 12: Debris accumulated on the shoulder forces cyclists into the roadway *Source: Oregon Bicycle and Pedestrian Plan*

Appropriate accommodations include roadway width, intersection improvements and maintenance activities. The FHWA document entitled "Selecting Roadway Treatments to Accommodate Bicycles" should be consulted in order to determine the type of improvements most suited to the particular roadway conditions.

The state inventory process was designed to get information from the public on proposed bicycle facilities, both on- road and off- road. The vast majority of proposals received were for bicycle paths rather than for on- road improvements. This may be due to the fact that many people do not feel comfortable cycling in traffic. Within the MAPC region, a number of roads were identified as being worthy of bicycle accommodations. In some instances, there was a recommendation for a specific type of improvement (i.e bike lane, paved shoulder, etc.). In other instances, the road was noted as being an important route but no specific improvements were suggested. Because most roads could benefit from bicycle accommodations, cities, towns and the state must institutionalize planning for bicycle accommodations by including bicycle accommodations at the earliest stages of design.

### **Bicycle Parking - Existing Conditions**

Bicycle parking is a critical component of an overall bicycle transportation system. Currently, bicycle parking is most often handled on a site-by-site basis, if provided at all. In most communities, bicycle parking is not required in the zoning bylaw. In the MAPC region, six communities have been identified that currently have bicycle parking requirements in their zoning: Belmont, Brookline, Cambridge, Holliston, Newton, Norfolk (See Appendix A). Bicycle parking is sometimes provided at municipal buildings such as schools, town halls or libraries. Colleges and universities often have extensive bicycle parking facilities. Parking at the MBTA stations is discussed in the section on inter-modal access below. For private developments, individual developers may decide to provide a bike rack at a shopping center or office park. There are no comprehensive inventories of existing bicycle parking facilities.

### **Bicycle Parking - Future Needs**

All MAPC communities should include bicycle parking requirements in their zoning bylaws. The bicycle parking requirements currently found in zoning bylaws in the region vary in their complexity and in the amount of parking required. The following section outlines some of the issues that should be considered when drafting a bylaw.

The amount of bicycle parking to be required can be calculated in several ways. One common way is as a percentage of automobile parking spaces required. Other ways include calculations based on the type of land use, building square footage, the number of employees or students or some combination. There are two types of bicycle parking facilities. Class I facilities are high security facilities that protect the entire bicycle and any accessories from theft and weather. This type of facility should be used in high crime area: or where long term, all day use is anticipated such as employee parking. Examples of this type of facility would be bicycle lockers, parking inside a building and limited access storage areas. Class II facilities are bicycle racks that support the frame of the bicycle and can be easily used with U-locks or cables and locks.

The location and layout of parking facilities is critical to their success. Parking should be highly visible to the occupants of adjacent buildings or passing pedestrians, well-lit, near the street and main building entrances, at ground level or accessible by elevator rather than stairs. They should be protected from the weather ( either indoors, under roofs or fully enclosed lockers). They should be designed to be sufficiently distant from pedestrians and cars with room to maneuver bikes and sufficient overhead clearance.

### **Key References**

**How to Get A Bicycle Parking and Amenities Ordinance Passed, League of American Bicyclists.  
North Carolina Bicycle Facilities Planning and Design Guidelines, Pages 59-61.**

## **Initiatives that Encourage Bicycling**

**Bicycle Commuting** - Trips to and from the workplace constitute 20% of all trips. Although there are certain constraints to bicycle commuting that are not a factor in other utility trips (employer attitudes, lack of showers, changing facilities and parking, etc.) these trips occur on a regular schedule, have the same origin and destination and route and therefore, can be the easiest to undertake routinely if other constraints can be overcome. They are critical trips for decreasing congestion because they can eliminate auto trips during peak hours.

Within the MAPC region, Boston, Cambridge, Somerville and Brookline have the highest numbers of bicycle commuters ranging from 2,456 in Boston to 534 in Brookline. Eight communities have bicycle commuters in the 101- 1,000 range. (Source: 1990 U.S. Census: Journey to Work data).

Bike-to-Work Week and the ongoing activities of the region's various Transportation Management Associations (TMAs) have been the primary means for promoting bicycle commuting. A regular source of funding for Bike-to-Work Week needs to be secured in order for this program to be effective. The integration of bicycles and transit is another key factor in the effectiveness of programs to promote bicycle commuting. There needs to be adequate, secure bicycle parking at all transit stations, the means to bring bicycles onto transit, and bicycle parking at the workplace.

### **Key References**

**Bike-to-Work Week Planning Guide, EarthWorks TransportAction**

Communities should consider bicycle amenities ordinances rather than zoning ordinances that only address bicycle parking. These ordinances would set requirements for new development to include showers and changing areas for bicycle commuters.

**Bike-to-Work Week** - In May of 1994, Earthworks Transportation Action, as well as the Conservation Law Foundation and the Bicycle Coalition of Massachusetts organized the first annual Bike-to-Work Week in the Boston metropolitan region. A second event was held in 1995. The week included guided bicycle rides into Boston and Cambridge, breakfasts for bicycle commuters, rallies and events held at various companies and local hospitals and colleges. A planning guide for organizing events at the workplace was developed and provides extensive information on the benefits of bicycle commuting as well as suggestions for overcoming obstacles to commuting.

**Transportation Management Associations (TMAs)** - TMAs are groups of employers who join together to hire a coordinator whose job is to develop alternatives to commuting by automobile. Many TMAs have bicycle commuting programs.

**Employer programs** - Bicycle commuting programs are most often found in larger companies or institutions such as hospitals or universities. One example in the MAPC region is Bolt Beranek and Newman (BB&N) in Cambridge. BB&N offers secure bicycle parking, showers and lockers. Massachusetts General Hospital reports that approximately 5% of its employees bike to work in good weather.

## **Existing Bike Maps**

There are a number of maps that have been produced by state agencies or private groups that show bicycle facilities and preferred bike routes. These maps vary in their geographic coverage, criteria for choosing preferred bicycle routes and level of detail.

**Boston's Bikemap** - This map was produced in 1994 and is available from BikeMaps Massachusetts, P.O. Box 1035, Cambridge, MA 02140. This map covers Arlington, Belmont, Boston, Brookline, Cambridge, Chelsea, Everett, Lexington, Malden, Medford, Needham, Newton, Somerville, Waltham and Watertown. It is a contour map showing bicycle paths and bicycle routes. It also provides information on bike organization, maps, books, bike shops, shows the Minuteman Commuter Bikeway, has information on regional access, inter-modal connections and safe bicycling.

**Claire Saltonstall Bikeway Map** - This map shows the route of the Claire Saltonstall Bikeway, an on-road bike route from Boston to Cape Cod. The map is available from Hostelling International/AYH, 1020 Commonwealth Avenue, Boston, MA 02215. Telephone: (617) 731-5430.

**How to Get Around in Cambridge** - This map is not strictly a bike map. It covers all aspects of travel in Cambridge using walking, bicycling and public transportation. The map was produced in 1995 by the City of Cambridge Community Development Program, Environment and Transportation Planning Division. The map was updated in 1996. It shows bicycle paths, bus and subway routes, how to get to the Minuteman Commuter Bikeway and includes information on bikes on the T as well as information for motorists regarding how to be alert for bicyclists and pedestrians. For more information call the Cambridge Community Development Program, Environment and Transportation Planning Division at (617) 349-4604.

**Massachusetts Bicycle Map** - This map was produced in 1987 and highlights two types of roads. The map identifies routes that are considered by local cyclists to be the best available through routes in the area. Alternative routes are also shown but these are roads that generally have poorer pavement, more curves, are narrower or have more traffic. These routes are not official bike routes and are for experienced cyclists. The map also shows bicycle paths, paths under development and official long distance routes as well as information on safety and is available from Hostelling International/ AYH (see above).

**MetroWest Bicycle Map** - The MetroWest Bicycle Map was produced in 1996 by the MetroWest Growth Management Committee Bicycle Task Force with funding from the Federal Highway Administration and the Massachusetts Highway Department. The map covers the following communities: Ashland, Dover, Framingham, Hudson, Marlborough, Natick, Needham, Sherborn, Southborough, Sudbury, Wayland, Wellesley and Weston. The map classifies roads in one of three suitability levels: best routes, routes for experienced cyclists and routes not recommended for bicycling. The suitability analysis was done by local cyclists. The map also gives directions for three recreational rides of approximately 30 miles each and includes safety information and points of interest. The map can be obtained by calling the MetroWest office at (508) 651-7350.

**Newton Bicycle and Pedestrian Map** - The City of Newton has recently published a map showing suggested bicycle recreational and commuter routes as well as walking routes. The map also flags dangerous intersections. For more information, contact the City of Newton Planning Department at (617) 552-7135.

**North Shore and Cape Cod Bicycle Map** - This is a detailed road and recreation map showing suggested routes, bikepaths, bike shops, state parks and campgrounds for Cape Cod and the Islands and the north shore from Marblehead into New Hampshire. The map is available at bike shops and bookstores or from BikeMaps Massachusetts.

**Future Mapping Needs** - Bicycle maps are useful for a number of reasons. They encourage people to ride by giving information specifically geared to bicycling not found on other maps such as terrain and the location of bike paths and bike lanes. They also reinforce the concept that bicycling is a mode of transportation. They can be educational tools because they provide a way to reach bicyclists with information on

how to ride safely in traffic and the rules of the road. However, the key purpose of bike maps, providing information on the suitability of the road network for bicycling, must be approached carefully. A bike map that displays information on road suitability must describe the criteria used and how the ratings were derived. It is important to remember that cyclists of varying abilities will use the map and will have different levels of comfort regarding road conditions. Road suitability also can change over time as traffic levels increase or road conditions deteriorate.

### Key References

- 1) **Recreational Mapping, North Carolina Dept. of Transportation**
- 2) **Some Thoughts on Producing Bicycle Maps, North Carolina Dept. of Transportation**
- 3) **Design Recommendations for Urban Bicycle Maps, Pro-Bike 84**
- 4) **MetroWest Growth Management Committee, Bicycle and Pedestrian Task Force**

### Inter-modal Access

**Existing Conditions** - Inter-modal access is one of the key components of the transportation element of MetroPlan 2000. Currently, there are some accommodations for bicycle access to transit facilities and limited bicycle parking facilities at some stations. There is also limited accommodation of bicycles on transit vehicles.

**MBTA** -The MBTA Bikes on the T program operates through a permit system. A permit costs \$5.00 and is good for three years. Bicycles are allowed on commuter rail Monday - Friday except during rush hour (morning inbound and evening outbound) and Saturday and Sunday, all day. They are also allowed on the subway on the Red, Blue and Orange lines. On weekdays, bikes are allowed during off-peak periods; between 10 a.m. and 2 p.m., and after 7:30 p.m. Bikes are permitted all day weekends. Bikes are not allowed on the Green line, on any buses and are not allowed to enter or exit at Park Street, Downtown Crossing, Government Center or the Aquarium stations. There are further restrictions on the maximum number of bikes as well as travel on certain holidays.

There are 131 stations on the MBTA's Rapid Transit system. Thirty-seven percent (37%) of the stations have some bicycle parking. Parking facilities range from single racks accommodating six bicycles to multiple racks accommodating up to 174 bicycles. The information on bicycle parking was provided by the MBTA. The data are from 1993 and are considered rough estimates. The inventory of bicycle parking is updated periodically.

The Red Line has the highest percentage of stations with bicycle parking (64%) and the Green Line has the lowest percentage (18%). Of the 85 commuter rail stations within the MAPC region, 42 (49%) have bicycle parking for a total of 936 bicycles. Only one station (South Acton) has bicycle lockers.



Figure 13: Bikes chained to fence demonstrates the need for parking facilities. Source: MAPC



Figure 14: Bicycle racks and lockers have been installed at the South Acton Commuter Rail Station. Source: MAPC

**Ferry Services** - Commuter passenger ferries travel between Boston, Hull and Hingham. Within Boston there are also several short routes across Boston Harbor. Passenger ferries also travel between Quincy and Provincetown and between Boston and Gloucester, and Boston and Provincetown, during the summer tourist season. There is also a Rowes Wharf water shuttle to the airport. These services accommodate bicyclists.

**Logan Airport** - It is possible to bicycle to Logan Airport via local roads and use the Massport shuttle bus to get to the terminals. The airport is also accessible by subway (subject to the above restrictions). The express buses from Braintree, Framingham and Woburn will take bicycles as does the Rowes Wharf water shuttle.

**Amtrak** - Amtrak's policy permits only boxed bikes on trains that have a baggage car between stations with baggage service.

**Buses** - There are no bicycles allowed on MBTA buses. The policy on other private bus lines varies. Specific bus companies should be contacted for their individual policies.

**Park and Ride Facilities** - The Massachusetts Highway Department (MHD) has a Park-And-Ride Policy. The policy states that park and ride facilities are designed to provide transfer points for automobiles, bicycle: pedestrians, and other feeder transportation services ...The bicycle and pedestrian provisions in this policy are as follows:

#### IV. Develop P&R facilities to capture bicycle and pedestrian traffic

- ⇒ Establish site selection criteria which would give priority to potential sites which are or could be bicycle and pedestrian accessible, to reduce the number of cold starts by vehicles.
- ⇒ Provide and maintain as necessary bicycle racks, lockers, shelters, bike paths, walkways and other elements designed to accommodate bicyclists and pedestrians.

#### VII. Ensure that P&R facilities are designed and located to maximize security and commuter safety.

- ⇒ Ensure that bicycle paths and parking areas are well lit.
- ⇒ Provide bicycle racks, lockers and other structures resistant to theft and vandalism."

**Future Needs** - Bicycle access, including parking, shall be provided at all transportation centers, such as rail and transit stations, park and ride lots, ferry terminals, and airports.

**Bicycle Parking:** Bicycle parking at transit stations should ideally include a combination of lockers and racks. Lockers can be either coin operated or rented on a monthly or yearly basis. The racks should be placed in a protected location or under a roof. Based on recent applications by several communities for funding for bicycle parking, the average cost per bicycle parking space is as follows:

\$712 per bicycle locker space  
\$62 per uncovered bicycle rack space  
\$850 per covered bicycle space

Although available space and usage estimates will vary from location to location, a generic model for transit parking consisting of 8 lockers and 25 covered bicycle spaces would cost approximately \$27,000.

Bicycles shall be permitted and physically accommodated aboard trains, ferries, buses, and planes. Physical accommodation shall be defined as meaning that bicycles will be accepted in the physical condition in which they arrive and be stored in facilities designed for the safe, secure transport of bicycles. The design of

future transportation terminals shall include bicycle access. Future purchases of vehicles and equipment shall also be designed and constructed to include bicycle access and physical accommodation of bicycles.

### Key References

**National Walking and Bicycling Study, Case Study No. 9: Linking Bicycle/Pedestrian Facilities with Transit, FHWA.**

**Integration of Bicycles and Transit, Transportation Research Board.**

### Land Use Considerations

**Existing Conditions** - Currently, there is very little consideration of bicycle transportation in land use planning at the community level. The majority of communities have no bicycle parking requirements or other references to bicycles in their zoning, subdivision regulations or site plan review. Bicycle use is most noticeable in more urban communities where destinations are closer together although these communities also have the most traffic and difficult conditions for bicycling on the roads. A number of communities have recently formed town bicycle committees to address ways to encourage bicycling within their community. The sprawling land use patterns in many communities creates great distances between residential and other uses, therefore discouraging bicycling.

**Future Needs** - One component of bicycle transportation planning that is often overlooked is the impact of land use. Because most people who use bicycles for utilitarian purposes use them for trips of under three miles, compact, mixed use development patterns encourage bicycling. It is important to have key destinations close by to residential development.

Zoning plays an important role by controlling land use density, the types of uses within an area, and the design of various types of development. The statement of purpose found within most zoning bylaws should include the encouragement of non-motorized transportation as a purpose. A zoning bylaw also regulates parking and should include provisions for bicycle parking. Subdivision regulations spell out in more detail how developments should be designed. Through zoning, bikeways can be required within subdivisions and adequate design guidelines can be included.

Within developments, there should be cuts in barriers at cul-de-sacs and dead end streets to allow bicycles to pass between developments and connect to nearby roads. This serves to shorten travel distances.

Development that is sited adjacent to the street and sidewalks rather than set back within large parking lots also encourages both bicycles and pedestrians.



Figure 15: Bicyclist arriving at the Alewife T Station.  
Source: MAPC

## IV. THE REGIONAL PEDESTRIAN SYSTEM

### The Components of a Regional Pedestrian System

Planning for the pedestrian also involves the Four “E”s: engineering, encouragement, education and enforcement. This plan will focus primarily on engineering ( which includes planning) and encouragement because these are the areas on which MAPC, as a regional planning agency, has the most influence.

Pedestrian planning needs greater attention because almost everyone walks at some point in the day. Although most people are pedestrians, in planning for pedestrian facilities, the focus should be on designing for populations that have specific limitations: children, senior citizens and the physically challenged. A pedestrian system that serves the needs of those with limitations will serve all pedestrians.

Case Study No. 24 of the National Bicycling and Walking Study found that, compared to bicycle facilities, there is much less information available on planning, designing and engineering for pedestrian facilities. The only statewide pedestrian facility design manual noted in the case study is the Florida Pedestrian Safety Plan. Much of the information on standards referred to below was taken from the Florida Plan.

The pedestrian advocacy group, Walk Boston, has compiled the following list of twelve components of a pedestrian-friendly urban environment:

- 1) Unobstructed walkways of ample width.
- 2) Crosswalks at all street crossings which are aligned in the desired direction of travel, properly marked, and of adequate width.
- 3) Signalization at crossings which aids the walker by providing predictable and sufficient crossing time for all people (including children, elderly, disabled).
- 4) Walkway surfaces which are smooth, even, and of minimal cross-slope.
- 5) Pedestrian ramps at all corners and other changes in grade which are properly pitched, oriented in the direction of the crosswalk, and free of puddles.
- 6) Well-lighted walkways and intersections without intermediate dark zones.
- 7) Well organized and designed pedestrian amenities and necessities such as benches, trash receptacles, public telephones, orientation signs and maps, newspaper dispenser and mail boxes.
- 8) Protection from adjacent travel lanes through such features as curb-side parking or planting strips.
- 9) Clean, well-maintained sidewalks, free of snow in winter months.
- 10) Shortest possible crossing distances afforded by curb neck-downs and small curb radii.
- 11) Seasonally appropriate weather protection including transit shelters, wind breaks, shade trees, and arcades.
- 12) Open sight lines at intersections and into adjacent parks, open spaces, and building setbacks.



Figure 16: Wide planter strip increases pedestrian comfort. Source: *Oregon Bicycle and Pedestrian Plan*



Figure 17: Poles in sidewalk narrow the space available. Source: *Oregon Bicycle and Pedestrian Plan*

## **Municipal Regulation of the Pedestrian Environment**

There is little quantitative information about the existing system of pedestrian facilities. The state will address inventorying facilities as part of the statewide pedestrian plan which will be completed this year.

The quality of the pedestrian environment is heavily influenced by policies, procedures and regulations at the local level. MAPC conducted a preliminary review of municipal bylaws, ordinances, and regulations to gain a better understanding of how communities currently address pedestrian accommodations. This review was conducted using MuniLaw, a computerized database of municipal zoning and general regulations that will eventually include all communities in Massachusetts.

The search was conducted using the keywords sidewalks, pedestrians, walkways, and paths. It is likely that some communities include sidewalks in their definitions of streets or public ways and therefore, some regulations that pertain to streets or public ways might have been missed during the search. The intent of this research is to provide an overview of regulatory approaches rather than a quantitative analysis. This search revealed that the degree of regulation of pedestrian accommodations varies widely with some communities having fairly complete coverage of key topics and others with only one or two provisions in their bylaws. MAPC will do a complete search of pedestrian-related zoning provisions for any community upon request.

This section presents an overview of how pedestrian issues are handled in zoning bylaws and general regulations. This analysis is presented in the form of a composite list of key provisions commonly found in zoning bylaws and general regulations. Some provisions routinely occur in certain sections of the bylaws or general regulations. Some communities have separate sections on streets and sidewalks and pedestrian behavior. MAPC can make available samples of actual provisions in zoning bylaws that can be considered by communities interested in adopting stronger pedestrian provisions.

### **A. Zoning Bylaws**

#### **Use Regulations**

- 1) **Statement regarding the pedestrian orientation of certain zoning districts:** For certain districts (usually the Central Business District), the zoning bylaw will state that the district is intended to have a pedestrian orientation.
- 2) **Sidewalk requirements:** Some bylaws will state where sidewalks are to be required. This is usually handled in subdivision regulations.
- 3) **Sidewalk design specifications:** This may be included in the zoning but is often found in subdivision regulations. Specifications may include required width, whether sidewalks must be on one or both sides of the street, or the length of sidewalk required per new lot.
- 4) **Separation:** The zoning may require that the sidewalk and street be separated by a buffer strip of a certain width, with or without landscaping.
- 5) **Relationship of sidewalk to natural features:** In more rural areas, there may be specific requirements about the relationship of sidewalks to natural features and less stringent requirements for paving.

#### **Off-Street Parking and Loading**

- 1) **Distance to parking:** Some bylaws specify the maximum distance between parking lots and buildings for visitor parking (often 500 feet ) and employee parking (800 feet ). It should be noted that this provision tends to favor access by car.

- 2) **Curbs:** It is common to specify the use of concrete curbs, berms or bumpers to protect sidewalks and walkways from cars overhanging these areas.
- 3) **Driveway location:** Most bylaws state that driveways must be located to minimize conflicts with pedestrians on the sidewalk.
- 4) **Statement of Intent:** Many bylaws state that it is the intent of the parking regulations to promote pedestrian safety.
- 5) **Delineation of pedestrian facilities:** Some bylaws require pedestrian walkways to be clearly marked and delineated and specify the use of directional signs in parking lots.
- 6) **Landscaping and separation:** Some municipalities specify that vehicular and pedestrian traffic must be separated and that buffer strips must be landscaped.
- 7) **Backing out:** Some communities prohibit backing out onto a public sidewalk from a parking space except for low-density residential districts.
- 8) **Lighting in parking lots and walkways:** Some bylaws require that pedestrian walkways be well-lighted and in such a way that nearby residences are not affected.
- 9) **Vehicle Queuing:** A few communities regulate vehicle queuing lanes so that vehicles will not encroach onto sidewalks or interfere with the travel or maneuvering of other vehicles into and out of parking spaces or driveways.

### **Site Plan and Special Permit Review**

- 1) **Statement of Purpose:** Almost all bylaws reviewed included a statement that one of the purposes of site plan and special permit review is to promote pedestrian safety.
- 2) **Plan submittal requirements:** Almost all bylaws require that plans show existing sidewalks and their condition as well as proposed sidewalks and walkways.
- 3) **Review criteria:** Require proof that the proposed development won't negatively impact pedestrian safety or comfort.
- 4) **Traffic Studies:** In bylaws that require traffic studies or impact studies for special permit projects, pedestrian patterns, facilities and impacts are required as part of the study.

### **Signs**

- 1) **Encroachment on sidewalks:** Most bylaws have some regulation concerning signs hanging over, or encroaching on the sidewalks.

### **Miscellaneous**

- 1) **Incentives for Pedestrian Amenities:** Brookline provides up to a 10% bonus in the number of dwelling units for superior site design which includes street improvements such as wider sidewalks, underground wiring, lighting, landscaping, and pedestrian walkways and benches.

Natick provides bonus floor area for developments in the Regional Center district that provide pedestrian circulation improvements. These improvements are defined in the bylaw and must be directly accessible to the pedestrian circulation system. Improvements include off-site sidewalks and pedestrian bridges and tunnels.

- 2) **Requiring Enhancements to the Pedestrian Environment** : For the City of Boston Midtown Cultural District, the zoning ordinance requires that each project enhance the pedestrian environment and lists a number of measures that qualify as pedestrian enhancements.

## **B. General Bylaws**

- 1) **Snow and ice removal**: Most communities spell out property owner responsibilities for snow and ice removal including time period during which snow must be removed and fines for failure to do so. Some communities also state that property owners are responsible for snow falling off roofs and eaves and that snow may not be placed on sidewalks while clearing private property.
- 2) **Runoff**: Communities frequently prohibit water from adjacent properties from running over the sidewalk or collecting on the sidewalks.
- 3) **Vegetation**: Some communities state that property owners may not allow vegetation to overhang or encroach on sidewalks.
- 4) **Incidental Obstructions**: Fences, doors, shutters, etc. may not swing out over sidewalk or interfere with the flow of pedestrian traffic.
- 5) **Construction**: Communities regulate who may dig up sidewalks, whether permits are required and set requirements for safety fencing and lighting.
- 6) **Other regulated uses**: Animals on the sidewalk, sledding, bicycling, skating, skateboarding.
- 7) **Dangerous materials** : Prohibition against placing or leaving any harmful or dangerous materials on the sidewalk.
- 8) **Obstructions**: Many cities and towns do address the issue of sidewalk obstructions. However, most references to obstructions in zoning and general regulations refer to temporary and moveable obstructions such as trash, building materials and vegetation, rather than what can be built on the sidewalk such as traffic control boxes, newspaper vending boxes, mailboxes, etc. Another obstruction that may be regulated is the location of trash dumpsters.

## **Sidewalks**

Sidewalks are the most important physical accommodation for the pedestrian. When planning for sidewalks, the following issues should be kept in mind: location, width, placement of obstructions, grade, separation from roadways, uses allowed on the sidewalks and, maintenance.

The following sidewalk standards are from the Florida Pedestrian Safety Plan.

- ⇒ Minimum width is 5 feet. Sidewalks that are 4 feet wide or less do not easily accommodate wheelchairs.
- ⇒ Sidewalks should be on both sides of all urban area roadways except limited access highways, unless land use dictates a need on only one side.
- ⇒ Every effort should be made to add sidewalks to all existing urban streets where they do not exist, and to complete missing links. Highest preference for completing these links should go to areas serving schools, parks, libraries, military bases, recreation centers, tourist zones, and where high levels of elder pedestrians can be anticipated.
- ⇒ Sidewalks should be free of obstructions (poles, signs, mailboxes, etc.).
- ⇒ Obstructions should be placed in the utility strip or on adjacent property (using easements).
- ⇒ If obstructions cannot be moved, the sidewalk should be widened.

- ⇒ Utility strips should be 3.5 feet (without trees) or 7 feet wide with trees.
- ⇒ Sidewalks should not be adjacent to the curb unless there are severe right-of-way constraints.
- ⇒ AASHTO requires that sidewalks adjacent to a curb be 6 feet wide.
- ⇒ In areas near schools or other major bicycle/pedestrian areas, sidewalks should be 8 feet.
- ⇒ Sidewalks should be included in all residential and commercial development plans submitted to public agencies for review and permit in an urban area.
- ⇒ Sidewalk maintenance activities should include snow, ice and debris removal, repair of areas of pavement upheaval and breakage, vegetation control, traffic signal button repair.

In addition, it is important to consider issues related to pavement materials. In some localities, bricks are used for historical or aesthetic reasons but may be harder to maintain and may pose problems for some pedestrians with mobility limitations.

## **Intersections**

Intersection design is a complex matter and must take into account traffic patterns, adjacent land uses, expected pedestrian characteristics and ADA requirements. The following are some of the key principles for pedestrian-friendly intersection design.

- ⇒ The pedestrian path of travel should be direct with minimal out-of-direction travel.
- ⇒ Large expanses of pavement should be interrupted.
- ⇒ Pedestrian signal heads should be clearly visible.
- ⇒ Maximum crossing width should be 48 feet.
- ⇒ Slip lanes, medians and bulbouts should be used to reduce street crossing exposure.
- ⇒ Roads should be designed to control turning speeds: below 20 mph on left turns and below 10 mph on right turns.
- ⇒ Adequate sight triangles should be maintained.
- ⇒ Left turns should be minimized or eliminated in high pedestrian volume areas.
- ⇒ Pedestrian signalization should provide for a walking speed of 3.5 feet per second.
- ⇒ In areas with high pedestrian volumes and at locations near senior centers, signalized intersections should be evaluated with respect to right-turns-on-red and pedestrian crossing interval.
- ⇒ T intersections should be encouraged because they have fewer conflict points for pedestrians.
- ⇒ Consider roundabouts at intersections in residential neighborhoods as they reduce vehicle speeds and pedestrian/vehicle conflicts.
- ⇒ Sidewalk crosswalks should be maintained.

## **Mid-Block Crossings**

Designing for safe mid-block crossing may be one of the least expensive safety improvements. It takes into account that pedestrians frequently cross mid-block rather than at intersections when doing so is more convenient than walking to the nearest intersection. Mid-block crossings are frequently done near major generators such as schools or senior centers. This treatment is often a viable solution when all three conditions apply: high pedestrian volumes, most direct route, least conflict with cars. Mid-block crossings improve pedestrian safety by responding to human needs, improving sight distances and reducing the number of conflict points.

## Trails and Pathways

Sidewalks are not the only type of spatial accommodation for pedestrians. The Oregon Bicycle and Pedestrian Plan recognizes three types of walkways: sidewalks, paths and shoulders. In general, sidewalks are designed and built primarily for pedestrians with occasional use by young bicyclists except in dense downtown areas where sidewalk bicycling is often prohibited.

MAPC has adopted the policy that bicyclists and pedestrians should be separated whenever possible and particularly where safety concerns dictate this approach. However, there is a great demand for multi-use paths in the region. Wherever such facilities have been built, they are heavily used by bicyclists, walkers, in-line skaters and joggers. Many of the new paths being built by the Metropolitan District Commission are being designed as multi-use paths. The Oregon Bicycle and Pedestrian Plan is a good example of a pro-active approach to multi-use paths. The plan acknowledges that many paths were originally conceived as bicycle paths but often see equal or greater use by other users. The plan states that "It is not realistic to plan and design a path for the exclusive use by pedestrians, as other users will be attracted to the facility". The Oregon Plan (Page 55) provides general planning principles and a set of guidelines for ensuring that multi-use paths serve both pedestrians and bicyclists.

"Multi-use paths can enhance bicycle and pedestrian travel in urban areas where the existing road system does not serve bicyclists and pedestrians well, or where abandoned railroads or other open spaces provide a corridor free of obstacles. Discontinuous street systems benefit from paths to reduce out-of-direction travel. Paths function best where street crossings can be eliminated or minimized."

The issue of multi-user trails is also examined in Case Study No. 7 (Transportation Potential and Other Benefits of Off-Road Bicycle and Pedestrian Facilities). This case study contains the following findings: Off-road facilities which are developed for the exclusive use by only one type of user are rare. Trails that are developed with one user in mind usually attract a wide range of users.

Restrictions on use are difficult to enforce and that most trails, therefore, do not operate as single-use facilities.

The most common type of off-road facility in the country is the single tread/multi-use trail. Single tread trails are less expensive to build and maintain and are often the only feasible design option where space is limited.

The Oregon plan also discusses design standards for multi-use paths. In general, multi-use paths should be at least 10 feet wide and in areas of high mixed-use, the preference is for 12 feet. Narrower paths should only be used as short connectors or where usage is expected to be low.

**Multi-User Conflicts** - The conflict between automobiles and pedestrians and cyclists has long been recognized in transportation planning. As bicycling and walking are encouraged and planned for as modes of transportation, conflicts between these two modes are becoming increasingly evident. In addition, conflicts are arising between in-line skaters, walkers, bicyclists and joggers. There are no off-road facilities that are designed for and used exclusively by one group of users. The conflicts are created by the different speeds at which different users travel, the level of experience, training, maturity, and the purpose of the trip.

In-line skaters can create problems on the roads as well as on sidewalks. In-line skaters use a side-to-side motion and on sidewalks and paths, they will likely be traveling faster than pedestrians but slower than many bicyclists. Bicycles on a sidewalk can be dangerous because of their speed, the number of pedestrians, and the presence of numerous obstacles; and yet unsafe road conditions or the age of the cyclist may create a situation where the sidewalk is perceived as a safer place to be. Pedestrians, as slower users of

paths, may not always stay to the right of the path or walk in single-file and may not always cross streets in designated locations. For any mode, whether it is walking, bicycling or in-line skating, users of different ages will act very differently. The purpose of the trip may also affect behavior. A recreational cyclist may ride more slowly and stop more often while a cyclist riding to work may travel more quickly.

Resolving multi-user conflicts is a matter of providing sufficient space, adequate design of facilities, education and enforcement of laws.

## **Traffic Signals**

Most decisions on traffic signals are made based on the traffic signal warrants in the Manual of Uniform Traffic Control Devices (MUTCD). This manual includes pedestrian signal warrants. A pedestrian activated signal is usually considered for locations where it is expected that many people will need to cross a roadway at a given location and there are few regular opportunities to cross the street. Pedestrian signals are often combined with curb extensions, raised medians and refuges. Other issues include the amount of time pedestrians must wait to cross and the ratio of steady walk signal to flashing walk. There are also innovative types of traffic signals that use sound for the visually impaired or that play a known sequence of music to indicate the amount of time left to cross.

## **Maintenance**

- ⇒ Sidewalks should be inspected and cleared of debris regularly.
- ⇒ Snow and ice removal is important to reduce the dangers of falls and to prevent pedestrians from being forced to walk in the street.
- ⇒ Large cracks or raised slabs should be corrected. These pose particular dangers to elderly and physically challenged pedestrians.
- ⇒ Inspections should also involve noting and correcting obstructions on the sidewalks such as the improper placement of street furniture and newspaper boxes. Missing or defaced signs should be corrected and light fixtures maintained.
- ⇒ Pavement markings at crosswalks should be inspected for fading.

## **Traffic Calming**

Traffic calming is a series of physical changes to streets designed to slow and restrict traffic to create a safer and more pleasant environment for cyclists, pedestrians and neighborhood residents. Traffic calming helps to mitigate the impacts of automobile traffic and creates a situation of more equal status for all road users so that automobiles do not dominate. Traffic calming originated in Europe but many of the techniques have been tried successfully in the United States. Traffic calming is most successful when it is applied area-wide rather than at one location. Traffic calming needs to be implemented through a structured planning process with community participation.

Traffic calming techniques include (but are not limited to):

Roundabouts	Slow points
Chicanes	Speed humps
Speed bumps	Intersection hump
Diagonal closure	Medians
Street closure	One-way closure
Gateway	Woonerf
Narrow streets	Bulbouts
Turn restrictions	Diagonal diverter

The Town of Brookline has done a comprehensive report on traffic calming.

### **Key References**

- 1) Bicycle Facility Planning - APA Planning Advisory Service Report #459, Pages 11-14.**
- 2) Case Study No. 19, Traffic Calming, Auto-Restricted Zones and other Traffic Management Techniques - Their Effects on Bicycling and Pedestrians, Federal Highway Administration.**
- 3) Brookline Report**

### **Walking in an Inter-Modal Context**

All transit trips begin and end with walking. Therefore, high priority should be given to providing pedestrian access to all forms of public transit (bus, subway, commuter rail, park and ride lots) as well as transportation facilities such as airports, bus terminals and rail. Transit stations that are sited for pedestrian access can enhance the surrounding neighborhood, encourage walking and can reduce the amount of parking and traffic associated with transit stations. Each type of transit facility has its own particular siting and design issues related to pedestrian access.

Because bus stops are so numerous and utilize the existing road network, there is often little thought given to their development, and facilities are minimal. Bus stops should be easily accessible on foot and should provide a pleasant waiting environment, including shelters, benches, landscaping, buffering from the road, and lighting. The layout and design of bus stops should take into account passenger boarding and exiting movements and the potential for conflicts with the pedestrians and bicyclists passing through the area. Bus shelters and sidewalks should be designed so that the bus shelter does not encroach and narrow the sidewalk from the recommended 6 feet of clear space. They should also be oriented to provide shelter from the prevailing winter winds. All transit stops should also include signage with route maps and schedules.

Commuter rail stations are fewer but usually involve more facilities. Fencing is often used for buffering and for safety. However, fencing should be carefully designed so that it does not block access. Consideration needs to be given to pedestrian desire lines so that there are safe ways to cross the tracks at points where this is most likely. Commuter rail stations often involve large parking lots. These need to be designed with walkways so that pedestrians do not need to walk through the parking lot. In addition, rail stations are often located on or near major roadways. The design of these stations must allow for safe crossing of these roads.

The relationship of transit stations to adjacent land uses is also important. The new concept in station siting is "Transit Oriented Design (TOD)". In TOD, the goal is to build stations in mixed-use community centers that combine transit with retail and services. Ideally, such developments would also be in or near residential neighborhoods.

To enhance the connection between transit and adjacent uses, building entrances should be oriented to transit and buildings should be clustered around transit stops. Zoning and land use development codes should encourage businesses to locate near transit.

### **Land Use Considerations**

**Land Use Patterns and Density** - Land use patterns have a major impact on whether or not walking is a viable mode of transportation. The density of cities is such that origins and destinations tend to be close together and therefore, accessible by foot. Suburban and rural areas discourage walking because origins and destinations are either too far apart or because the road network is designed for automobile traffic

and poses barriers for pedestrians even if the distances are not prohibitive. In suburban areas, businesses are designed to be readily accessible by car, buildings are set back from the street and separated from the roads by parking.

While density is one factor that supports walking, mixed-use zoning and development is also an important factor. In areas where residential development is in close proximity to retail development, walking is more likely to occur.

The Oregon Bicycle and Pedestrian Plan notes that suburban areas require particular improvements for both bicycle and pedestrian access. These are:

- ⇒ Controlling private accesses on arterials;
- ⇒ Providing safe pedestrian and bicycle access to shopping malls;
- ⇒ Redesigning parking lots to allow better pedestrian access and circulation;
- ⇒ Providing safe crossings of multi-lane roads;
- ⇒ Encouraging land-use patterns that place origin and destination points within reasonable bicycling and walking distance;
- ⇒ Connecting cul-de-sacs and dead-end streets with streets or paths; and
- ⇒ Shortening travel distances with multi-use paths.



Figure 18: Median allows pedestrian to cross one lane of traffic at a time.

Source: Oregon

**MetroPlan 2000** - The introduction to the Transportation Element of MetroPlan 2000 states that "The action recommendations for MetroPlan emphasize consolidating travel and demand in a strong economic core and concentrated development centers. The hope is that in this environment, carpooling, vanpooling, walking, bicycling and transit will be feasible to a far greater extent than today." This approach is the most important factor in creating a more walkable environment.



## **V. IMPLEMENTATION OF THE REGIONAL BICYCLE AND PEDESTRIAN SYSTEM**

### **Introduction**

This chapter will cover three critical elements in implementing a regional bicycle and pedestrian system. It will describe the process for identifying high and medium priority regional projects and for identifying local projects. It will also delineate the various ways in which MAPC can influence bicycle and pedestrian projects and it will discuss the local role in implementation.

Implementation of the bicycle/pedestrian plan is overseen by the MAPC Bicycle/Pedestrian Committee. The committee functions in an advisory capacity to the MetroPlan Committee. In addition, it works closely with MAPC's Metropolitan Planning Organization (MPO) Liaison Committee. The Bicycle/Pedestrian Committee has three key roles:

- a) To oversee the development and implementation of a bicycle/pedestrian plan for the MAPC region.
- b) To review and make recommendations on funding requests for feasibility studies, the TIP (Transportation Improvement Program), Transportation Enhancements and CMAQ (Congestion Mitigation Air Quality) funds.
- c) To review and advise on policies and programmatic decisions related to bicycle and pedestrian transportation.

### **Identifying Regional Bicycle and Pedestrian Priorities**

**Process for Setting Project Priorities:** The goal of this process is to identify projects that meet regional needs and set priorities based on criteria related to the goals of MetroPlan 2000. The process was used to evaluate known projects as well as to identify new projects that would help to meet regional development goals. This process will also be used to evaluate projects as they are brought forward in the future.

- 1) **Identify regional criteria:** The primary criteria that were used to identify a regionally significant project were the project's relationship to a designated Concentrated Development Center and its contribution to improving access to transit. Secondary criteria were whether or not a project was part of a network of existing or proposed facilities, whether it served more than one community and whether the project removed an obstacle to bicycling or walking or significantly improved safety.

A project that satisfied both primary criteria was almost always designated as a high priority regional project. A project that satisfied one of the primary criteria was generally designated as a medium priority regional project. The secondary criteria were used primarily to distinguish between medium priority and low priority or local projects.

The following questions were asked to determine if a project was regionally significant:

- 1) Is the project located in, or provides access to, a designated MAPC growth area or Concentrated Development Center?
- 2) Does the project provide better access to a commuter rail or transit stop or other transportation facility?
- 3) Does the project link more than one community?

- 4) Does the project link other existing or potential bicycle facilities?
- 5) Are there major destinations (including, but not limited to, schools, colleges, shopping centers, office parks and recreation areas) along the route?
- 6) Does the project remove a significant obstacle to bicycle use or improve safety?
- 7) Does the project maintain or enhance existing facilities?

Several of these criteria are difficult to quantify and were used as guidelines rather than in a strictly objective manner.

- 2) **Apply criteria to known projects** - The statewide inventory of bicycle projects is the most comprehensive listing of projects, both conceptual and actual. Other projects were added to this list from other sources. The criteria were applied to these projects to evaluate them for regional significance.
- 3) **Identify additional projects using the criteria** - This process had two components. One was an evaluation of the entire transit system to identify those stations where bicycle and pedestrian access is most critical, again based on proximity to CDCs and whether the station was a multi-modal point (rail, bus, subway connections). The second was to develop new project ideas by looking at a map of regional land uses, CDCs and transit stations. These ideas were presented to the subregions for their review.
- 4) **Develop a draft project priority list** - A draft project priority list was developed and distributed to the subregions.
- 5) **Meetings with the subregions** - The draft project priority list was discussed with all eight MAPC subregions. The list was revised based on comments from the subregions.

### Regional Bicycle/Pedestrian Project Priorities

Table V-A shows the breakdown of projects by type and priority.

**Table V-A  
Summary of Bicycle/Pedestrian Projects**

<b>Project Type</b>	<b>High Priority Regional</b>	<b>Medium Priority Regional</b>	<b>Local</b>
Paths	15	18	12
On-road	28	30	21
Parking	55	44	86

Table V-B (Page 44) shows the bicycle and pedestrian project priorities based on key MetroPlan 2000 criteria. Three types of projects are shown: bike paths, on-road projects and bicycle parking.

These priorities reflect regional concerns based on MetroPlan 2000. As the regional planning agency, it is MAPC's role to bring a comprehensive regional development perspective to a multitude of policy deliberations as well as specific actions such as decisions on project funding. This list of project priorities will be referred to as MAPC participates in the transportation planning/funding process but will not be the sole criterion on which decisions on projects are based. Other factors are local support for specific projects, cost-effectiveness, feasibility and project readiness. MAPC will continue to maintain a database on these projects which will include more detailed information on project costs, mileage, potential usage,

etc. This information will be used to further rank projects and to ensure that scarce resources are used cost-effectively.

Table V-C (Page 53) is a sample page from the larger database. It is included to illustrate what additional information on projects will be collected and maintained. This level of information is helpful when refining priorities. For the most part, these details are unavailable until a project is in the later stages of planning or design. MAPC will maintain and expand this database.

### **Updating the Project List**

The project priority list and associated database represents the status of current projects at the time of adoption of the plan. Because this is MAPC's first attempt to create a database of bicycle and pedestrian projects, errors and omissions are inevitable. MAPC will make corrections as they are brought to our attention.

MAPC will update the project list/database on a regular basis as new information becomes available. Twice a year, MAPC will publish the current list and request that communities or organizations who are sponsoring projects provide updated information. This process will also enable new projects to be brought forward, reviewed by the bicycle/pedestrian committee and added to the list. MAPC will develop a form to ensure that uniform information is collected for all projects.

### **Implementing Project Priorities**

A key function of the project priority list will be to help guide MAPC's efforts to implement the plan. Because projects are at different levels of development ranging from conceptual to under construction, implementation activities will vary. In general, projects that are in the design stage will need the least follow-up from MAPC.

MAPC's efforts will be directed primarily towards those projects identified as high priority regional projects. For projects that are in the planning stage, MAPC will assist project sponsors in identifying and applying for the appropriate funding sources. Priority status will be one factor that MAPC will consider, as one of the MPO agencies responsible for funding decisions on the Transportation Improvement Program.

For high priority regional projects that are conceptual, MAPC will work with communities and state agencies to further evaluate and develop these concepts to bring them to the planning stage. These projects are critical to MAPC because they help to implement MetroPlan 2000.

Because many worthwhile projects, particularly pedestrian improvements, are local rather than regional in scale, MAPC will also devote time to assisting local bicycle and pedestrian committees and communities in developing projects and local bicycle/pedestrian plans.

MAPC's annual work program for bicycle and pedestrian activities will be developed in conjunction with the MAPC Bicycle and Pedestrian Committee.

## Notes on Table V-B: Regional Bicycle and Pedestrian Priorities

### Project

**Name:** This is a short name given to each project to identify it. Projects frequently are known by more than one name.

---

**Type:** Path: multi-use path separated from auto traffic developed for bicycles, pedestrians and a variety of other non-motorized users.

Road: on-road accommodations for bicycles.

Park: indicates a bicycle parking facility.

Ped: sidewalks or other amenities designed primarily for pedestrian use.

Comb: some combination of facilities.

---

**Status:** Construction: project is being built.

Design: project is being designed or design has been completed.

Planning: feasibility study underway, completed or programmed.  
Project sponsors actively working with MAPC, state or local government to study project. Funding application being developed or submitted.

Inactive: project is not currently undergoing any activity.

Conceptual: project has been submitted as part of the statewide inventory or identified by MAPC as meeting a regional need but no planning activities have yet been initiated.

---

**Transit:** No indicates that the project is not located at or near a subway station, commuter rail station or other transit facility excluding local bus stops.

Green, Red, Blue, Orange indicates that the project is at or near a subway line.  
If commuter rail, the name of the line is indicated.

---

**CDC:** Yes indicates that the project is located within, or provides access to an MAPC designated Concentrated Development Center (CDC).

---

**Multi Town:** Yes indicates that the project is located in more than one community.

---

**Linkage:** Yes indicates that the project would connect to an existing facility.

Pot. (potential) indicates that the project would connect to another facility if both are constructed.

---

**Priority:** High = Meets most MetroPlan 2000 criteria for high priority regional project.

Medium = Meets several MetroPlan 2000 criteria for medium priority.

Low/Local = Project does not meet MetroPlan 2000 criteria and primarily serves local needs.

Comments: For projects that are conceptual, the project may be identified as having been submitted as part of the state bicycle project inventory process. A project may also be identified as having been suggested during the MAPC subregional process (see Page 40).

.....

NA: Not applicable.



Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		CDC	Secondary MetroPlan Criteria		Priority	Comments	
		Transit	Multi Town Linkage						
High Priority Regional Projects									
Watertown Branch	Planning	Alewife	Yes	Yes	Yes	High	Studied as connector between Minuteman and Charles River.		
Bike to the Sea	Planning	Orange Line	Yes	Yes	Yes	High	Feasibility study completed.		
Charles River	Planning	Red Line	Yes	Yes	Yes	High	MDC master plan underway.		
Alewife/Mystic	Planning	Alewife	Yes	No	Yes	High	MDC is responsible agency.		
Lowell-Sudbury	Inactive	W. Concord	No	Yes	Yes	High	MAPC portion inactive. Bruce Freeman Path in design.		
Assabet River Path	Planning	S. Acton	No	Yes	Yes	High	Feasibility study completed.		
Central Mass.	Planning	Waltham	Yes	Yes	Yes	High	Feasibility study underway.		
Sudbury Aqueduct	Conceptual	Framingham	Yes	Yes	Yes	High	Potential linkage to Upper Charles		
Saxonville ROW	Conceptual	Natick	Yes	No	No	High	Provides access under Turnpike.		
Upper Charles	Planning	Framingham	Yes	Yes	Yes	High	Feasibility study underway.		
Salem - M'head 1	Design	Salem	Yes	Yes	Yes	High			
Maynard Spur	Planning	S. Acton	No	No	Yes	High			
MBTA Fitchburg Line	Conceptual	Yes	Yes	No	Yes	High			
Bikeway to Danehy Park	Design	No	No	No	Yes	High			
Red Line Linear Park Extension	Design	Yes	No	No	Yes	High			
Mass. Ave. Route 111	Conceptual	S. Acton	Yes	Yes	NA	High	State inventory. Route to the S. Acton Commuter Rail.		
Route 30 - Natick, Wayland	Conceptual	Framingham	Yes	Yes	NA	High	State inventory.		
Rte. 135 MetroWest	Conceptual	Yes	Yes	Yes	NA	High	MAPC subregional process.		
Route 126 Metrowest	Conceptual	Framingham	Yes	Yes	NA	High	MAPC subregional process.		
Route 16 MetroWest	Conceptual	Yes	No	Yes	NA	High	MAPC subregional process.		
Union - Hemenway	Conceptual	Framingham	Yes	No	NA	High	MAPC subregional process.		
Burlington Mall Rd.	Conceptual	No	No	No	No	High	MAPC subregional process.		
Route 28	Conceptual	Reading	No	Yes	NA	High	State inventory. Reading, N. Reading		
Route 129	Conceptual			Yes		High	MAPC subregional process.		
Sylvan St. - Peabody	Conceptual			No		High			
Route 127 Danvers to Gloucester	Planning			Yes		High			
Salem Sq.	Conceptual	Yes	Yes	No	No	High	State inventory.		
Rte. 1A	Conceptual			Yes		High			
Cape to Cape				Yes		High			
Beverly roads	Planning					High			
Salem roads	Planning					High			
Swampscott roads	Planning					High			
Lynn roads	Planning					High			

# Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority	Comments
		Transit	CDC	Multi Town	Linkage		
Bev. bikeway segment 1	Planning	Yes	No	No		High	
Rte. 128 overpass	Conceptual	No	No	No	No	High	Would overcome major obstacle to bike/ped access.
S. Weymouth NAS	Conceptual			No		High	MAPC subregional process.
Route 53	Conceptual					High	
Hingham - Hull Bike path	Planning		No	Yes		High	
Route 16 SWAP	Conceptual					High	
Route 115	Conceptual					High	
Bk. Rte. 1	Planning					High	
Kingsley Park Bridge	Design	Alewife	Yes	No	Yes	High	
Route 9 crossing	Design	Yes	No	No	Yes	High	Overcomes major obstacle.
Melrose - Cedar Park : Racks/ lockers.	Conceptual	Haverhill	No	No	NA	High	MAPC subregional process.
West Medford: Racks and lockers.	Conceptual	Lowell	No	No	NA	High	MAPC subregional process.
Waltham: Racks and lockers.	Conceptual	Gardner	Yes	No	NA	High	MAPC subregional process.
West Newton: Racks and lockers.	Conceptual	Framingham	No	No	NA	High	MAPC subregional process.
Readville: Racks and lockers.	Conceptual	Providence	No	No	NA	High	MAPC subregional process.
North Station: Racks and lockers.	Conceptual	Green	Yes	No	NA	High	MAPC subregional process.
Kenmore: Racks and lockers.	Conceptual	Green/Bus	Yes	No	NA	High	MAPC subregional process.
Riverside: Racks and lockers.	Conceptual	Green	No	No	NA	High	MAPC subregional process.
Malden: Racks and lockers.	Conceptual	Orange	Yes	No	NA	High	MAPC subregional process.
Forest Hills: Lockers.	Conceptual	Orange	No	No	NA	High	MAPC subregional process.
Alewife: Lockers.	Conceptual	Red/Bus	Yes	No	NA	High	MAPC subregional process.
South Station	Conceptual	Red	Yes	No	NA	High	MAPC subregional process.
Braintree: Lockers.	Conceptual	Red	No	No	NA	High	MAPC subregional process.
Auburndale	Conceptual	Framingham	No	No	NA	High	MAPC subregional process.
Newtonville	Conceptual	Framingham	No	No	NA	High	MAPC subregional process.
Woodland	Conceptual	Green	No	No	NA	High	MAPC subregional process.
Oak Grove	Conceptual	Orange	No	No	NA	High	MAPC subregional process.
Littleton-495	Conceptual	Gardner	No	No	NA	High	MAPC subregional process.
Concord	Conceptual	Gardner	No	No	NA	High	MAPC subregional process.
Lincoln	Conceptual	Gardner	No	No	NA	High	MAPC subregional process.
Littleton - proposed station	Conceptual	Gardner	No	No	NA	High	MAPC subregional process.
Ashland (new station)	Conceptual	Framingham	No	No	NA	High	MAPC subregional process.
Framingham	Conceptual	Framingham	Yes	No	NA	High	MAPC subregional process.
Natick	Conceptual	Framingham	Yes	No	NA	High	MAPC subregional process.
Kendall Green	Conceptual	Gardner	No	No	NA	High	MAPC subregional process.

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority	Comments
		Transit	CDC	Multi Town	Linkage		
N. Wilmington	Conceptual	Haverhill	No	No	NA	High	MAPC subregional process.
Wilmington	Conceptual	Lowell	No	No	NA	High	MAPC subregional process.
Regional Transportation Center	Planning.	Lowell	No	No	NA	High	MAPC subregional process.
Reading	Conceptual	Haverhill	No	No	NA	High	MAPC subregional process.
Ipswich	Conceptual	Ipswich	No	No	NA	High	MAPC subregional process.
Beverly Depot	Conceptual	Ipswich	No	No	NA	High	MAPC subregional process.
Salem	Conceptual	Ipswich	Yes	No	NA	High	MAPC subregional process.
Gloucester	Conceptual	Gloucester	Yes	No	NA	High	MAPC subregional process.
Prides Crossing	Conceptual	Gloucester	No	No	NA	High	MAPC subregional process.
Greenbush-Scituate	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
N. Scituate	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
Cohasset	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
Nantasket Junction	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
West Hingham	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
E. Weymouth	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
Weymouth Landing	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
Quincy Center	Conceptual	Braintree	No	No	NA	High	MAPC subregional process.
Braintree	Conceptual	Braintree	No	No	NA	High	MAPC subregional process.
S. Weymouth	Conceptual	Old Colony	No	No	NA	High	MAPC subregional process.
Hingham- Rte 3A @ shipyard	Conceptual	Park & Ride	No	No	NA	High	MAPC subregional process.
Pembroke - Rte. 3/139	Conceptual	Park & Ride	No	No	NA	High	MAPC subregional process.
Rockland - Rte 3/228	Conceptual	Park & Ride	No	No	NA	High	MAPC subregional process.
Forge Park - 495	Conceptual	Franklin	No	No	NA	High	MAPC subregional process.
Franklin	Conceptual	Franklin	Yes	No	NA	High	MAPC subregional process.
Needham Heights	Conceptual	Needham	No	No	NA	High	MAPC subregional process.
Norwood Central	Conceptual	Franklin	No	No	NA	High	MAPC subregional process.
Sharon	Conceptual	Providence	No	No	NA	High	MAPC subregional process.
Canton Junction	Conceptual	Providence	No	No	NA	High	MAPC subregional process.
Stoughton	Conceptual	Stoughton	No	No	NA	High	MAPC subregional process.
Endicott	Conceptual	Franklin	No	No	NA	High	MAPC subregional process.
Medium Priority Regional Projects							
Southcove Harbortrail	Planning	S. Station	Yes	No	Yes	Med.	
Middlesex Canal	Planning	Probably	?	Yes		Med.	

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority	Comments
		Transit	CDC	Multi	Linkage		
Hartwell Ave. path	Planning		No	No	Yes	Med.	
Central Somerville	Planning		?	No		Med.	
Minuteman Extension W.	Planning		?	No		Med.	
Lynnfield ROW	Conceptual		No	No		Med.	MAPC subregional process.
Tri-Community	Planning		No	Yes		Med.	Enhancements application.
Border-Boston ROW	Planning		No	Yes		Med.	Feasibility study will be done in 1997.
Peabody	Planning		?	No		Med.	
RR ROW Bellingham	Conceptual		No	No		Med.	
Bedford - N. Billerica	Planning	No	No	Yes	Yes	Med.	
Weir River - Nantasket	Conceptual	No	No	Yes	Yes	Med.	
Eastern Ave. B&M Bikepath	Design	Yes	Yes	No	No	Med.	
Charlestown Waterfront	Planning	Yes	Yes	No	Yes	Med.	
Riverway Extension to Kenmore	Conceptual	Yes	Yes	No	Yes	Med.	
Jamaica Pond- Forest Hills	Planning	Yes	No	No	Yes	Med.	
Norwood - Providence	Conceptual	No	No	Yes	No	Med.	
Bk. Rte. 1(Claire Saltonstall Bikeway)	Planning					Med.	
Route 16	Conceptual					Med.	
Assembly Sq.ped.	Conceptual		No	No		Med.	
Rte. 2A Littleton	Conceptual		No			Med.	
Route 117	Conceptual		?	Yes		Med.	MAPC subregional process.
Route 27 Sherborn-Natick	Conceptual	Natick	Yes	Yes	NA	Med.	MAPC subregional process.
Rte. 85 Tpke.to Marlboro Ctr.	Conceptual	No	No	Yes	NA	Med.	MAPC subregional process. Also state inventory.
Gt. Plain Ave. - Needham Ctr.	Conceptual	Needham	No	No	NA	Med.	MAPC subregional process.
Maple Street (Weston)	Conceptual	No	No	No	Yes	Med.	MAPC subregional process.
Stoneham roads	Planning		No	No		Med.	MAPC subregional process. Close to Central Mass. trail.
Wakefield roads	Planning		No	No		Med.	
Lynnfield roads	Planning		No	No		Med.	
Middlesex Tpke.	Conceptual		No	No		Med.	
Minuteman connector	Conceptual		No	Yes		Med.	
Endicott St. Danvers	Conceptual	No	No	No	NA	Med.	
Rte. 114	Conceptual		No	No		Med.	
Rte. 62 Danvers- N. Reading	Conceptual		No	Yes		Med.	
Lowell St., Peabody	Conceptual		?	No		Med.	
Highland Ave/Rte. 107	Conceptual		No			Med.	
Route 97-Beverly to Topsfield	Conceptual		No	Yes		Med.	

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		CDC	Secondary MetroPlan Criteria		Priority Comments
		Transit			Multi Town	Linkage	
Northern coastal route	Conceptual	No		No			Med. MAPC subregional process.
Southern coastal route	Conceptual	No		No			Med. MAPC subregional process.
Route 109	Conceptual						Med.
Route 126	Conceptual				Yes	NA	Med. State inventory. Ashland, Lincoln, Concord, Wayland, Framingham.
Greenlodge St.Bridge	Conceptual				No		Med. State inventory.
Edgehill to Burma Rd.	Conceptual						Med. State inventory.
Route 135 - Dedham	Conceptual			No	Yes		Med. State inventory.
Readville- Walpole/Rte. 128 station	Conceptual			No			Med. State inventory.
Forsyth Street Bike Route	Design	Yes		Yes	No	Yes	Med. Current enhancement project.
Airport	Conceptual	Blue		Yes	No	NA	Med. MAPC subregional process.
Chelsea: Racks.	Conceptual	Ipswich		Yes	No	NA	Med. MAPC subregional process.
Brandeis-Robert: Lockers.	Conceptual	Gardner		No	No	NA	Med. MAPC subregional process.
Highland: Racks.	Conceptual	Needham		No	No	NA	Med. MAPC subregional process.
Chelsea Rte. 1 Park & Ride	Conceptual	Park & Ride		No	No	NA	Med. MAPC subregional process.
Watertown Car Barn: Racks.	Planning	Bus		No	No	NA	Med. MAPC subregional process.
Wonderland: Racks.	Conceptual	Blue		No	No	NA	Med. MAPC subregional process.
Beachmont	Conceptual	Blue		No	No	NA	Med. MAPC subregional process.
Lechmere	Conceptual	Green		Yes	No	NA	Med. MAPC subregional process.
Boston College	Conceptual	Green		No	No	NA	Med. MAPC subregional process.
Fenway	Conceptual	Green		Yes	No	NA	Med. MAPC subregional process.
Prudential	Conceptual	Green		Yes	No	NA	Med. MAPC subregional process.
Northeastern	Conceptual	Green		Yes	No	NA	Med. MAPC subregional process.
Wellington	Conceptual	Orange		No	No	NA	Med. MAPC subregional process.
Community College	Conceptual	Orange		Yes	No	NA	Med. MAPC subregional process.
Downtown Crossing	Conceptual	Orange		Yes	No	NA	Med. MAPC subregional process.
N.E. Medical Center	Conceptual	Orange		Yes	No	NA	Med. MAPC subregional process.
Mass. Ave.	Conceptual	Orange		Yes	No	NA	Med. MAPC subregional process.
Roxbury Crossing	Conceptual	Orange		Yes	No	NA	Med. MAPC subregional process.
Stony Brook	Conceptual	Orange		No	No	NA	Med. MAPC subregional process.
Broadway	Conceptual	Red		Yes	No	NA	Med. MAPC subregional process.
Savin Hill	Conceptual	Red		No	No	NA	Med. MAPC subregional process.
Fields Corner	Conceptual	Red		No	No	NA	Med. MAPC subregional process.
Davis	Conceptual	Red		No	No	NA	Med. MAPC subregional process.
W. Concord	Conceptual	Gardner		No	No	NA	Med. MAPC subregional process.
Wellesley Hills	Conceptual	Framingham		No	No	NA	Med. MAPC subregional process.

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority Comments
		Transit	CDC	Multi Town	Linkage	
Wellesley Farms	Conceptual	Framingham	No	No	NA	Med. MAPC subregional process.
Wellesley Square	Conceptual	Framingham	No	No	NA	Med. MAPC subregional process.
W. Natick	Conceptual	Framingham	No	No	NA	Med. MAPC subregional process.
Wakefield	Conceptual	Haverhill	No	No	NA	Med. MAPC subregional process.
Wegemere	Conceptual	Lowell	No	No	NA	Med. MAPC subregional process.
Greenwood	Conceptual	Haverhill	No	No	NA	Med. MAPC subregional process.
Burlington bus	Conceptual	Bus	No	No	NA	Med. MAPC subregional process.
North Beverly	Conceptual	Ipswich	No	No	NA	Med. MAPC subregional process.
Swampscott	Conceptual	Ipswich	No	No	NA	Med. MAPC subregional process.
Rockport	Conceptual	Gloucester	No	No	NA	Med. MAPC subregional process.
W. Gloucester	Conceptual	Gloucester	?	No	NA	Med. MAPC subregional process.
Manchester	Conceptual	Gloucester	No	No	NA	Med. MAPC subregional process.
Beverly Farms	Conceptual	Gloucester	No	No	NA	Med. MAPC subregional process.
Walpole	Conceptual	Franklin	No	No	NA	Med. MAPC subregional process.
Route 128	Conceptual	Providence	No	No	NA	Med. MAPC subregional process.
Dedham Corporate	Conceptual	Franklin	No	No	NA	Med. MAPC subregional process.
Southboro	Planning	Framingham	No	No	NA	Med. MAPC subregional process.
Weston	Planning	Framingham	No	No	NA	Med. MAPC subregional process.
<b>Local Projects</b>						
N. Stoughton/Braintree Hills	Conceptual	?	No	Yes	No	Low
E. Boston Greenway (Gt. Marsh)	Planning		?	No		Low
Parking at Somerville squares	Conceptual		No	No		Low
Cochituate Aqueduct	Conceptual	Yes	No	Yes	Yes	Low
Weston Aqueduct	Conceptual		?	Yes		Low
Lowell-Sudbury	Inactive		No	Yes	Yes	Low
Rockland - Hanover ROW	Conceptual		No	Yes		Low
Wrentham RR ROW	Planning		No	No		Low
Massapoag - Borderlands	Planning		No	No		Low
Dedham Sq. Readville	Conceptual		No	No		Low
MDC Neponset- Dorchester	Planning	Yes	No	No	Yes	Low
Sherborn Bike Path	Planning	No	No	No	No	Low
Littleton Road	Conceptual		No	No		Low
Route 126 - Lincoln - Concord	Conceptual		No	Yes		Low

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority Comments
		Transit	CDC	Multi	Town Linkage	
Burlington Mall-town ctr.	Conceptual		No	No		Low
Jeffreys Neck Rd, Ipswich	Conceptual		No	No		Low
Argilla Rd. to Crane's Beach	Conceptual		No	No		Low
Linebrook Rd. - Ipswich	Conceptual		No	No		Low
East St. - Middleton	Conceptual		No	No		Low
Larch/Dodges Row, Wenham	Conceptual		No	No		Low
Route 22 & Grapevine Rd.	Conceptual		No	No		Low
Route 35 Danvers	Conceptual		No	No		Low
Route 133 Ipswich	Conceptual		No	No		Low
Route 22 Beverly/Essex	Conceptual		No	Yes		Low
Bev. Bikeway Segment 2:	Planning	Yes	No	No		Low
Bev. Bikeway Segment 3	Planning	Yes	No	No		Low
Norwell Bikeway	Planning	No	No	No		Low
Route 135 - Hopkinton.	Conceptual		No	No		Low
Route 27 - Sherborn	Conceptual		No	No		Low
Maple St. - Bellingham	Conceptual		No	No		Low
Dedham Corp. Ctr/Rustcraft	Planning		No	No		Low
Medfield Bike Routes	Planning		No	No		Low
Route 27 - Medfield, Walpole	Conceptual		No	Yes		Low
Newton Highlands	Conceptual	Green	No	No	NA	Low
Bellevue	Conceptual	Needham	No	No	NA	Low
Melrose Highlands	Conceptual	Haverhill	No	No	NA	Low
Wyoming Hill	Conceptual	Haverhill	No	No	NA	Low
Kendall Green	Conceptual	Gardner	No	No	NA	Low
Waverly	Conceptual	Gardner	No	No	NA	Low
Belmont Center	Conceptual	Gardner	No	No	NA	Low
Porter Square	Conceptual	Gardner	No	No	NA	Low
Yawkey	Conceptual	Framingham	Yes	No	NA	Low
West Roxbury	Conceptual	Needham	No	No	NA	Low
Rosindale	Conceptual	Needham	No	No	NA	Low
Hyde Park	Conceptual	Providence	No	No	NA	Low
Fairmount	Conceptual	Dorchester	No	No	NA	Low
Morton St.	Conceptual	Dorchester	No	No	NA	Low
Uphams Comer	Conceptual	Dorchester	No	No	NA	Low
Arlington - MHD Rte 2.	Conceptual	Park Ride	No	No	NA	Low

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority	Comments
		Transit	CDC	Multi Town	Linkage		
Revere Beach	Conceptual	Blue	No	No	NA	Low	MAPC subregional process.
Suffolk Downs	Conceptual	Blue	No	No	NA	Low	MAPC subregional process.
Orient Heights	Conceptual	Blue	No	No	NA	Low	MAPC subregional process.
Wood Island	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
Maverick	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
Aquarium	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
State	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
Govt. Center	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
Bowdoin	Conceptual	Blue	Yes	No	NA	Low	MAPC subregional process.
Science Park	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Haymarket	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Park St.	Conceptual	Red/Green	Yes	No	NA	Low	MAPC subregional process.
Boylston	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Arlington	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Copley	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Auditorium	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Cleveland Circle	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Longwood	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Brookline Village	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Brookline Hills	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Beaconsfield	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Reservoir	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Chestnut Hill	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Newton Center	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Eliot	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Waban	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Symphony	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Museum - Ruggles	Conceptual	Green	Yes	No	NA	Low	MAPC subregional process.
Shattuck St.	Conceptual	Green	No	No	NA	Low	MAPC subregional process.
Sullivan	Conceptual	Orange	No	No	NA	Low	MAPC subregional process.
Chinatown	Conceptual	Orange	Yes	No	NA	Low	MAPC subregional process.
Back Bay	Conceptual	Orange	Yes	No	NA	Low	MAPC subregional process.
Ruggles	Conceptual	Orange	Yes	No	NA	Low	MAPC subregional process.
Jackson Square	Conceptual	Orange	No	No	NA	Low	MAPC subregional process.
Green Street	Conceptual	Orange	No	No	NA	Low	MAPC subregional process.
Porter	Conceptual	Red	No	No	NA	Low	MAPC subregional process.

Regional Bicycle and Pedestrian Priorities - Table V-B

Project Name	Status	Primary MetroPlan Criteria		Secondary MetroPlan Criteria		Priority	Comments
		Transit	CDC	Multi Town	Linkage		
Harvard	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Central	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Kendall	Conceptual	Red	Yes	No	NA	Low	MAPC subregional process.
Charles - MGH	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
J.F.K. U-Mass.	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Ashmont	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Shawmut	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
North Quincy	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Wollaston	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Quincy Center	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Quincy Adams	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Cedar Grove	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Butler	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Milton	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Central Ave.	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Valley Road	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Capen Street	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
Mattapan	Conceptual	Red	No	No	NA	Low	MAPC subregional process.
S. Acton	Conceptual	Gardner	No	No	NA	Low	MAPC subregional process.
Silver Hill	Conceptual	Gardner	No	No	NA	Low	MAPC subregional process.
Hastings	Conceptual	Gardner	No	No	NA	Low	MAPC subregional process.
Mishawum	Conceptual	Lowell	No	No	NA	Low	MAPC subregional process.
Winchester	Conceptual	Lowell	No	No	NA	Low	MAPC subregional process.
Hamilton-Wenham	Conceptual	Ipswich	No	No	NA	Low	MAPC subregional process.
Montserrat	Conceptual	Gloucester	No	No	NA	Low	MAPC subregional process.
Norfolk	Conceptual	Franklin	No	No	NA	Low	MAPC subregional process.
Needham Center	Conceptual	Needham	No	No	NA	Low	MAPC subregional process.
Needham Junction	Conceptual	Needham	No	No	NA	Low	MAPC subregional process.
Norwood Depot	Conceptual	Franklin	No	No	NA	Low	MAPC subregional process.
Islington	Conceptual	Franklin	No	No	NA	Low	MAPC subregional process.
Canton Center	Conceptual	Stoughton	No	No	NA	Low	MAPC subregional process.
Hersey	Conceptual	Needham	No	No	NA	Low	MAPC subregional process.
Plymptonville	Conceptual	Franklin	No	No	NA	Low	MAPC subregional process.
Windsor Gardens	Conceptual	Franklin	No	No	NA	Low	MAPC subregional process.

# Bicycle and Pedestrian Projects - Additional Data - Table V-C

Project Name	Community	Primary Subregion	Other Subregion	Type	Cost Estimate	Miles	TIP Status	Funding Sources	Project Sponsor	Local Support
<b>High Priority Regional Projects</b>										
Watertown Branch		IC		Path	NA	3.39			EOTC	Yes
Bike to the Sea		IC		Path	\$2.5 - 3.0 mil.	9.4		Enh.?	Local	Yes
Charles River		IC		Path					MDC	NA
Alewife/Mystic		IC		Path					MDC	NA
Lowell-Sudbury		MAGIC		Path					None	Unknown
Assabet River Path		MAGIC		Path	\$3.5 - 4.5 mil.	12			Local	Yes
Central Mass.		MW	MW	Path					Local	Provisional
Sudbury Aqueduct		MW	MAGIC	Path					None	Unknown
Saxonville ROW		MW		Path					None	Unknown
Upper Charles		SWAP	MW	Path					Local	Provisional
Salem - M'head 1		NSTF		Path					Local	Yes
Maynard Spur				Path						
MBTA Fitchburg Line				Path						
Bikeway to Daneyh Park				Path						
Red Line Linear Park Extension				Path						
Mass. Ave. Route 111		MAGIC		Road					None	NA
Route 30 - Natick, Wayland		MW		Road					None	NA
Rte. 135 MetroWest		MW		Road					None	NA
Route 126 MetroWest		MW		Road					None	NA
Route 16 MetroWest		MW		Road					None	NA
Union - Hemenway		MW		Road					None	NA
Burlington Mall Rd.	Framingham	MW		Road					None	NA
Route 28	Burlington	NSPC		Road					None	NA
Route 129		NSPC		Road					None	NA
Sylvan St. - Peabody	Peabody	NSTF		Road					None	NA
Route 127 Danvers to Gloucester		NSTF		Road					None	NA
Salem Sq.	Salem	NSTF		Road					None	NA
Rte. 1A		NSTF		Road					None	NA
Cape to Cape		NSTF		Road					None	NA
Beverly roads	Beverly	NSTF		Road					NSBC	NA
Salem roads	Salem	NSTF		Road					NSBC	NA
Swampscott roads	Swampscott	NSTF		Road					NSBC	NA
Lynn roads	Lynn	NSTF		Road					NSBC	NA

SAFETY COPY

## The Transportation Improvement Program (TIP)

The TIP process, culminating in the development of the TIP, is one of the most important means for securing funding for roadway and other transportation construction projects as well as feasibility and design projects. The TIP can include regular roadway projects that have a bicycle/pedestrian accommodation element as well as projects utilizing funds specifically earmarked for bicycle/pedestrian projects (Transportation Enhancements Funds).

In May, 1996 the legislature passed a bill regarding bicycle and pedestrian access in the construction of public ways. The text of the bill is as follows:

"Section 2A. The commissioner shall make all reasonable provisions for the accommodation of bicycle and pedestrian traffic in the planning, design, and construction, reconstruction or maintenance of any project undertaken by the department. Such provisions that are unreasonable shall include, but not be limited to, those which the commissioner, after appropriate review by the bicycle program coordinator, determines would be contrary to acceptable standards of public safety, degrade environmental quality or conflict with existing rights of way."



Figure 19: Bicycle parking is a critical part of the transportation system. Source: MAPC

The passage of this bill signals a new era in providing for bicyclists and pedestrians. In order to be effective however, a major effort will be needed to institutionalize the consideration of bicycle and pedestrian needs into an established process that traditionally has been focused on the automobile.

One of the most critical implementation issues for the regional bicycle and pedestrian system will be for MAPC to thoroughly review the TIP process by which projects are developed, designed, tracked, funded and constructed to identify those points at which the design of bicycle and pedestrian accommodations need to be considered. This may involve a number of actions including, but not limited to:

- a) New language in the letters that go out to community officials soliciting projects for the TIP.
- b) Revised procedures for Mass. Highway Department district engineers.
- c) Revisions to the project database maintained by MAPC to include information on what bicycle/pedestrian accommodations are being included.
- d) Working with local highway departments.
- e) Development of model checklists for local engineers and highway department engineers to assess appropriate bicycle and pedestrian accommodations.
- f) Assisting communities in locating consultants and engineers with bicycle/pedestrian design experience.

## Pavement Management

MAPC also has a very active pavement management program. MAPC's staff works with member communities to reduce costly roadway deterioration through proper pavement maintenance and repair strategies. Bicycles are even more sensitive than automobiles to irregularities in the road surface. Therefore, the pavement management program has the potential to be an effective means for educating local highway departments about the needs of bicyclists and of encouraging decisions on repaving to take the needs of cyclists into consideration.

## **Reviews Under the Massachusetts Environmental Policy Act (MEPA)**

Every year, MAPC reviews many Environmental Notification Forms (ENFs) and Environmental Impact Reports (EIRs) on a wide variety of projects. Through our comment letters, MAPC has, and will continue to raise development specific concerns regarding the provision of bicycle and pedestrian access, bicycle parking and site design.

## **Technical Assistance to Communities and the Subregions**

Because bicycle and pedestrian planning are relatively new areas for municipal officials and citizens, a key role for MAPC is to provide technical assistance. MAPC maintains a library of information which is available to any interested party. This plan has been written to help local decision makers quickly find the most relevant reference materials by highlighting these throughout the text. MAPC will work with the subregions to provide this information as well as with individual communities with specific needs.

## **The Municipal Role**

While there are many players at the state and regional level, there is much that happens at the municipal level that affects the bicycle and pedestrian environment. The most important local actions regard zoning and subdivision bylaws.

MAPC encourages all communities to form local bicycle committees and pedestrian committees. Many issues such as bicycle parking, siting of sidewalks, evaluation of roads for bicycle accommodations, review of roadway projects, and revision of land use regulations such as zoning and subdivision codes are local. MAPC will help to support bicycle and pedestrian committees through workshops and other technical assistance.



Figure 20: This overlay project added smooth, paved shoulders. *Source: Oregon Bicycle and Pedestrian Plan*

# **APPENDIX A:**

## **MUNICIPAL BICYCLE PARKING ZONING BYLAWS**

### **Brookline**

#### **Article 6 Vehicular Service Uses Requirements**

Section 6.00 (f) It is further the intent of this Article to encourage the use of bicycles for many types of personal travel by means of assuring the residents of multi-family residential buildings of the availability of convenient and safe places for storage of their bicycles, sheltered from precipitation, and secure against theft or vandalism of the bicycles or accessories thereon. Such facilities shall be provided in accordance with the general regulations of Section 6.10, as well as the bicycle parking space and design regulations of Section 6.14.

#### **Section 6.14 Bicycle Space and Design Regulations**

- (a) Spaces for off-street parking of bicycles shall be provided for the residents of each multi-family residential building in the amount of one space per five housing units or fraction thereof, not counting units having a ground floor entrance, subject to the further provisions of this Section and Section 6.10. The requirements of this Section shall not apply to that portion of a housing development designed exclusively for elderly persons.
- (b) Each bicycle parking space shall be sufficient to accommodate a bicycle at least seven feet in length and two feet wide, and shall be provided with some form of steel frame permanently anchored to a foundation, to which a bicycle frame and at least one wheel may be conveniently secured using a chain and padlock, or other easily portable bicycle lock in common usage. The separation of the bicycle parking spaces and the amount of corridor space shall be adequate for convenient access to every space when the parking facility is full. Any bicycle parking space within a structure to be used for motorized bicycles shall be subject to regulations pertaining to interior storage of gasoline.
- (c) Changes in the requirements of this Section, consistent with the intent of this Article, may be approved by the Board of Appeals for an individual building by special permit.

### **Newton**

#### **Section 30-19**

(k) *Bicycle Parking Facilities.* In the design and construction of parking facilities containing twenty (20) stalls or more, space shall be allocated exclusively for bicycle parking.

- (1) Bicycle parking shall be provided in the amount of one bicycle space per ten (10) parking stalls or fraction thereof, except that no more than thirty (30) such bicycle parking spaces shall be required.
- (2) Bicycle parking spaces shall be located near the entrance to the use or structure which the parking facility serves and shall, if possible, be within view of pedestrian traffic, without impeding pedestrian flow, so as to minimize the risk of thievery.
- (3) Each bicycle parking space shall be sufficient to accommodate bicycles of at least seven (7) feet in length and two (2) feet wide, and shall be provided with some form of steel frame permanently anchored to a foundation, to which a bicycle frame and at least one (1) wheel may be conveniently secured using a chain and padlock or other bicycle lock in common usage. The separation

of the bicycle parking spaces and the amount of corridor space associated therewith shall be adequate for convenient access to every bicycle space when the parking facility is full.

## **Belmont**

5.1 (h) Bicycle Racks. For premises requiring 40 or more parking spaces, bicycle racks facilitating locking shall be provided to accommodate one bicycle per 20 parking spaces required or fraction thereof.

## **Holliston**

Section V Special Regulations

h. Bicycle Racks - For parking areas of forty or more spaces, bicycle racks facilitating locking shall be provided to accommodate one bicycle per twenty parking spaces required or fraction thereof.

## **Norfolk**

Section 1.6.c. Bicycles. Not less than one Bicycle Parking or Storage Space shall be created for every twenty vehicular parking spaces created.

## **Cambridge**

Section 6.11 Intent. It is the intent of this Article 6.000 to reduce traffic congestion and thereby promote the safety and welfare of the public, by establishing requirements for off street parking and loading in conjunction with the use of land...The parking standards contained herein are intended to encourage public transit, bicycle usage and walking in lieu of automobiles where a choice of travel mode exists...

6.22.3 Accessory bicycle parking spaces required under the provisions of this Article 6.000 must be located on the same lot as the use being served or a contiguous lot in the same ownership.

6.35 Reduction of Required Parking. Any required amount of parking may be reduced upon issuance of a special permit from the Board of Zoning Appeal. However, handicapped parking required by Subsection 6.34, bicycle parking required by Subsection 6.37, and commercial vehicle parking required by subsection 6.31.5 shall not be reduced.

6.37 Bicycle Parking. Off street parking of bicycles shall be provided as follows:

6.37.1 For multifamily residences there shall be one bicycle space or locker for each two dwelling units or portion thereof.

6.37.2 For all other uses, except those exempted in Subsection 6.37.4, there shall be one bicycle parking space for each ten (10) automobile parking spaces or fraction thereof required in Subsection 6.36.

6.37.3 Uses allowed to have reduced parking by special permit under Subsection 6.35 shall nevertheless be required to provide bicycle spaces or lockers in the amount of one for each ten (10) automobile parking spaces or fraction thereof that would otherwise be required for such use in Subsection 6.36.

6.37.4 No accessory bicycle parking shall be required to serve the following uses as listed in the Section

6.36, Schedule of Parking and Loading Requirements: townhouse, elderly housing, funeral home, veterinary office, gas station, car wash, gravestone sales, warehouse, auto body or auto repair shop.

6.49 Design of Bicycle Parking spaces. Bicycle parking spaces shall be provided in accordance with the amounts required by Section 6.37 and with the design regulations in this Section 6.49.

6.49.1 Each bicycle parking space shall be sufficient to accommodate a cycle at least six (6) feet in length and two feet wide, and shall be provided with some form of stable frame permanently anchored to a foundation to which a bicycle frame and both wheels may be conveniently secured using a chain and padlock, locker or other storage facilities which are convenient for storage and are reasonably secure from theft and vandalism. The separation of the bicycle parking spaces and the amount of corridor space shall be adequate for convenient access to every space when the parking facility is full.

6.49.2 When automobile parking spaces are provided in a structure, all required bicycle spaces shall be located inside that structure or shall be located in other areas protected from the weather. Bicycle parking spaces in parking structures shall be clearly marked as such and shall be separated from auto parking by some form of barrier to minimize the possibility of a parked bicycle being hit by a car.

6.49.3 Bicycle parking spaces shall be located near the entrance of the use being served and within view of pedestrian traffic if possible, and shall be sufficiently secure to reasonably reduce the likelihood of bicycle theft.

6.49.4 Changes in the requirements of this section, consistent with the intent of this article, may be approved by the Board of Zoning Appeal for an individual building by special permit.

6.52 Every such plan for a proposed new, altered, or expanded use which provides five or more parking spaces shall indicate thereon the location of and provision for bicycle parking.



## **APPENDIX B:**

### **REFERENCE MATERIALS ON BICYCLE AND PEDESTRIAN PLANNING**

This is a partial list of the resource materials available at MAPC. It contains the most useful and references for general bicycle and pedestrian planning. A copy of the complete list is available upon request.

#### **Reports and Manuals**

- 1) Bike to Work Week Planning Guide: an EarthWorks TransportAction Program, Feb. 1994
- 2) How To Get A Bicycle Parking and Amenities Ordinance Passed, League of American Wheelmen, 1994.
- 3) Bicycle-Traffic Volumes in Metropolitan Boston, December, 1982 , Central Transportation Planning Staff Technical Report #37.
- 4) U.S. Department of Transportation Federal Highway Administration. National Bicycling and Walking Study. There are 24 separate case studies prepared as part of this study. A list of these studies is available from MAPC. MAPC has the following case studies:
- 5) Final Report: The National Bicycling and Walking Study - Transportation Choices for a Changing America.
- 6) Case Study No. 1: Reasons Why Bicycling and Walking Are And Are Not Being Used More Extensively as Travel Modes
- 7) Case Study No. 2: The Training Needs of Transportation Professionals Regarding the Pedestrian and Bicyclist.
- 8) Case Study No. 3: What Needs to be Done to Promote Bicycling and Walking?
- 9) Case Study No. 4: Measures to Overcome Impediments to Bicycling and Walking.
- 10) Case Study No. 6: Analysis of Successful Grassroots Movements Relating to Pedestrians and Bicycles and A Guide on How to Initiate a Successful Program.
- 11) Case Study No. 7: Transportation Potential and Other Benefits of Off-Road Bicycle and Pedestrian Facilities.
- 12) Case Study No. 9: Linking Bicycle/Pedestrian Facilities with Transit
- 13) Case Study No. 10: Trading Off Among the Needs of Motor Vehicle Users, Pedestrians, and Bicyclists.
- 14) Case Study No. 19: Traffic Calming, Auto-Restricted Zones and other Traffic Management Techniques - Their Effects on Bicycling and Pedestrians.
- 15) Case Study No. 21: Integrating Bicycle and Pedestrian Considerations into State and Local Transportation Planning, Design, and Operations.
- 16) Case Study No. 22: The Role of State Bicycle/Pedestrian Coordinators
- 17) Case Study No. 23: The Role of Local Bicycle/Pedestrian Coordinators
- 18) Case Study No. 24: Current Planning Guidelines and Design Standards Being used by State and Local Agencies for Bicycle and Pedestrian Facilities.
- 19) Building Better Bicycling: A Manual for Improving Community Bicycling Conditions, Prepared by the Federal Highway Administration Baystate Roads Program, University of Massachusetts, February 1994.
- 20) Traffic Calming: The Solution to Urban Traffic and a New Vision for Neighborhood Utility, CART, Australia, 1989.
- 21) Selecting Roadway Design Treatments to Accommodate Bicycles: A Manual. Federal Highway Administration. Prepared by the Bicycle Federation of America and the Center for Applied Research, November, 1992.

- 22) Guide for the Development of Bicycle Facilities, August 1991, American Association of State Highway and Transportation Officials.
- 23) Rails-with-Trails: Sharing Corridors for Recreation and Transportation. Rails-to-Trails Conservancy, 1993.
- 24) A Vision for Reconnecting America, Rails-to-Trails Conservancy at the Junction, 1994.
- 25) Rails-to-Trails Conservancy, Annual Report, 1993.
- 26) Secrets of Successful Rail-Trails: An Acquisition and Organizing Manual for Converting Rails into Trails, Rails-to-Trails Conservancy in cooperation with the National Park Service, 1993.
- 27) Rails-To-Trails Conservancy Fact Sheets
  - a) Local Funding Sources
  - b) Top 10 Ways to Work With the Opposition
  - c) Who Actually Owns the Right-of-Way?
  - d) Surfacing Your Trail
  - e) Rail Trails and Liability
- 28) Going Places...Workshop Proceedings from the 4th National Rails-to-Trails Conference, September 29-October 2, 1993, Concord, California, Rails-to-Trails Conservancy.
- 29) The Impacts of Rail-Trails: A Study of Users and Nearby Property Owners from Three Trails, Executive Summary. U.S. Department of the Interior, National Park Service, Rivers and Trails Conservation Program, 1992 in cooperation with The Pennsylvania State University.
- 30) The Bicycle Advocate's Action Kit, Bicycle Federation of America.
- 31) Bicycle Friendly Communities: Program Guidelines, League of American Bicyclists, 1994.
- 32) Bicycle Safety-Related Research Synthesis, U.S. Dept. of Transportation, Federal Highway Administration, April 1995.
- 33) Conflicts on Multiple Use Trails: Synthesis of the Literature and State of the Practice. Federal Highway Administration and the National Recreational Trails Advisory Committee.
- 34) Beyond Bike Routes: Building a System of Bikeways, Pro Bike News, August, 1993
- 35) Bike Lane or Shared Roadway? ProBike News, March 1993

### **Reports from Communities/ Other States/Countries**

- 36) Nantucket Bicycle and Pedestrian Master Plan, prepared for the Nantucket Planning and Economic Development Commission by Vanasse Hangen Brustlin, Inc. November 1994.
- 37) City of Cambridge Mayor's Bicycle Committee Initial Report to Mayor Alice K. Wolf and the Cambridge City Council 10/9/91
- 38) The Effect of the Burke-Gilman Trail Upon Property Values of Adjacent and Nearby Properties and Upon the Property Crime Rate in the Vicinity of the Trail, Seattle Engineering Department, Executive Summary, Sept. 1986.
- 39) Retro-Fitting Bike Lanes Onto Existing Urban Roadways - Guidelines. Prepared by the Oregon Department of Transportation.
- 40) Elements of a Comprehensive Local Bicycle/Pedestrian Plan - Oregon Department of Transportation.
- 41) North Carolina Bicycle Facilities Planning and Design Guidelines, January 1994, North Carolina Department of Transportation, Office of Bicycle and Pedestrian Transportation.

## REFERENCE MATERIALS ON PEDESTRIAN PLANNING

- 1) Florida Pedestrian Safety Plan, Florida Department of Transportation, Safety Office, February, 1992.
- 2) Walk Tall: A Citizen's Guide to Walkable Communities, Pedestrian Federation of America.
- 3) Walkable Communities: Twelve Steps for an Effective Program, June 1993, Florida Department of Transportation, State Safety Office.
- 4) Handbook for Walkable Communities, Dan Burden and Michael Wallwork.
- 5) Bicycle and Pedestrian Plan, Bonneville Metropolitan Planning Organization, Idaho Falls, Idaho.
- 6) Bicycle and Pedestrian Action Plan for the Rochester Metropolitan Area, Genesee Transportation Council.
- 7) Community Walking Resource Guide, Massachusetts Highway Department, August, 1996.

### Organizations

Bicycle Coalition of Massachusetts  
214A Broadway  
Cambridge, MA 02139  
(617) 491- 7433  
Website: [www.massbike.org](http://www.massbike.org)

Bicycle Federation of America  
1506 21st Street NW  
Washington, DC 20036  
(202) 463-6622

Bicycle Parking Foundation  
PO Box 7342  
Philadelphia, PA 19101  
(215) 222-1253

Adventure Cycling Association  
PO Box 8308  
Missoula, MT 59807  
(406) 721-1776

Earth Works Transport Action  
42 Robinwood Avenue, #2  
Jamaica Plain, MA 02130  
(617) 983-9463

League of American Bicyclists  
190 W. Ostend Street  
Suite 120  
Baltimore, MD 21230  
(410) 539-3399

Rails-to-Trails Conservancy  
1400 16th Street NW  
Washington, DC 20036  
(202) 797-5400

Walk Boston  
156 Milk Street  
Boston, MA 02109  
(617) 451-1570

National Bicycle & Pedestrian Clearinghouse  
1506 21st Street NW  
Suite 210  
Washington, DC 20036  
(800) 760 - NBPC  
Fax: 202 463-6625

Center for Liveable Communities  
1414 K Street  
Suite 250  
Sacramento, CA 95814  
(916) 448-1198

Hostelling International/AYH  
1020 Commonwealth Ave.  
Boston, MA 02215  
(617) 731-5430





